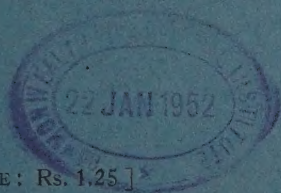




COLONY OF MAURITIUS

Annual Report
OF THE
Department of Agriculture
1950



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J. ELIEL FELIX, GOVERNMENT PRINTER,
PORT LOUIS, MAURITIUS
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In the Annual Report of the Department of Agriculture for 1948, I defined policy in general terms as "the utilization of the Island's land resources, whether in public or private ownership to the best advantage in the interests of all its inhabitants"; and I indicated the parts which the Agricultural Department and other departments of Government have to play in carrying out this policy. More precise definition is the task of the Administration and the Legislature. The Agricultural Department, the other departments of Government and the advisory boards and committees concerned with land usages in one aspect or another can do no more than advise. But if policy is to take account of realities, it must fit within a framework which is determined by the limitations of natural resources and by economic and social factors.

For over two centuries the useful plants of the world have filtered into Mauritius—mainly through the Botanical Gardens at Pamplemousses, established in 1758—and of them all only sugar has survived as a major economic crop. This solitary survival is explained partly by economic history and partly by the fact that much of the island's arable area is especially suitable for cane cultivation; and its consequence is that by far the greater part of the Colony's resources in land, capital and skill is irrevocably bound up with the sugar industry. This industry, because it has some of the characteristics of a manufacturing economy, has enabled a high population density—comparable with that of the United Kingdom—to be attained; a density which could not be maintained, at least on present standards of living, by an economy based on bulk production of foodstuffs or export of unprocessed industrial crops.

However much one may deplore monoculture, it is an unescapable fact that the wellbeing of everyone in Mauritius depends—and, in all probability, will for long continue to depend—on sugar. It follows that the chief object of policy should be to promote the prosperity and efficiency of the sugar industry.

This cardinal principle need not, of course, conflict with the development of other crops suited to the island's economy. One object of policy in the development of "plantation" crops other than sugar, notably tea and fibre, though the precise measures by which this development is to be achieved are still the subjects of debate. These two crops fit particularly well into the ecological picture; tea is suited to the higher rainfall zone above the present altitude limit for cane, while fibre production, for the local manufacture of bags, can be considerably expanded in the drier regions. It is not impossible, however, that cane will compete even for the possession of these regions, as irrigation is expanded in the drier areas and as canes adapted to wetter conditions are evolved.

The achievement of a greater self-sufficiency in foodstuffs is also part of the accepted agricultural policy. To this there are definite limitations. Most of the land suitable for food crop production is occupied by cane and replacement of cane by bulk food crops would, in the present circumstances, tend to injure rather than promote the Colony's economy—because, to put it in its simplest terms, the product of an acre of cane can be exchanged indirectly for a greater quantity of bulk foodstuffs than could be produced directly from that acre. It is therefore necessary—except, of course, in times of emergency—to concede a greater importance to securing an adequate supply of the essential perishable and protective foodstuffs, including milk, than to the production of carbohydrates.

Plans for the expansion of the Agricultural Division—the Division of the Department which is concerned with field work on crops other than cane—and for animal husbandry work which gives first priority to improvement of milk supply have been made and accepted as part of the programme for implementing these lines of policy.

A notable advance in the clarification of one aspect of policy was the publication during the year of a White Paper on the Crown Forest Lands.* These lands have a total area of about 67,150 acres and they comprise the central watershed of the island in which are the sources and headstreams of all the larger rivers. Most of this area was purchased by Government in the years between 1880 and 1904, after deforestation of the main watershed had resulted, according to contemporary reports, in very serious consequences to the Colony's water supplies and the effective rainfall of certain regions.

The lands have since been used partially for forest plantations and the spontaneous growth on the remainder has been protected so that it affords an effective cover. Proposals for more intensive utilization have been made from time to time and there has recently been some doubt about the future of this vital area.

The White Paper defines the policy which will guide the utilization of the Crown Forest Lands. Protection of the watersheds is the dominant consideration. Certain areas (total 6,186 acres) are, however, reserved for tea planting should they be required for this purpose. The programme of afforestation has prior claim over the remainder, but land which is not needed for this programme may, subject to certain safeguards, be utilized for other purposes.

The Natural Resources Board, a body intended to play a large part in the definition and administration of land policy, remained in a state of suspended animation awaiting consideration of the Bill it had drafted. This had been deferred until the completion of the proposed land utilization survey. Unfortunately, it proved impossible, owing to lack of staff, even to make a start with this survey during the year.

*White Paper on Crown Forest (Land Utilization) and Forestry. Government Printer, Port Louis, September, 1949.

Staff of the Department of Agriculture

The senior posts in the Department are as follows :—

Director

Deputy Director

Deputy Director in charge of Agricultural Division*

Chemist, Sugarcane Research Station†

Botanist, Sugarcane Research Station†

Plant Breeder, Sugarcane Research Station

Senior Agricultural Officer (2 posts)†

Senior Veterinary Officer

Animal Husbandry Officer

Veterinary Officer†

Plant Pathologist

Sugar Technologist

Registrar, Central Board

Accountant, Central Board

Chief Chemist and Assistant Registrar, Central Board

Entomologist

Associate Entomologist

Chemist, Agricultural Chemistry Division

Tea Officer*

Fisheries Officer

There are 19 officers who are Assistant Heads of Divisions or of similar grade (including 4 Agricultural Officers), 44 officers of the grade of Scientific Assistant or its equivalent (including Agricultural Inspectors), 17 Overseers or officers of similar grade, 15 members of the Clerical staff and 20 Laboratory Attendants and Messengers.

In the Fisheries Branch there are 7 inspectors of three grades and 50 guards of three grades. The staff of the College of Agriculture consists of a Principal and Lecturer in Agriculture (vacant), three Lecturers and three Assistant Lecturers.

* Included in the Development and Welfare Estimates.

† Vacant

Staff Movements

The Director of Agriculture left the Colony on overseas leave in January, 1950, and had not returned by the end of the year. During his absence the Deputy Director acted as Director and at various times the Chemist of the Agricultural Chemistry Division, the Senior Agricultural Officer and the Registrar of the Central Board acted as Deputy Director.

The Chief Chemist and Assistant Registrar of the Central Board left on overseas leave on 16th June and returned to duty on 22nd December.

The Chemist of the Division of Agricultural Chemistry and the Tea Officer left on overseas leave on 25th June and on 6th October, 1950, respectively, and had not returned by the end of the year.

The Sugar Industry

Weather conditions for the growth of the 1950 sugar crop were by no means ideal. From November 1949, until February 1950, rainfall was generally below average. February was particularly dry, and in some parts rainfall for the month was only 25 per cent or 30 per cent of the average. Fortunately there was a period of abundant and well-distributed rain during March and April, but from May onwards the fall was again well below average.

The season was also somewhat cooler than usual. During the months of February to May, when the cane is growing, temperatures were 0.6°C to 0.9°C below the mean. This, of course, slowed down growth, but the combination of relatively cool and dry conditions hastened cane maturation.

The cyclone is the bogey of Mauritius. Perhaps it will be well to explain, for the benefit of those familiar only with the cyclone or depression of temperate regions, that our cyclones are violent revolving storms identical with the hurricanes of the Caribbean, the typhoons of the China seas and the willie-willies of Western Australia. We worry quite a lot about them every year; anxiety reaches a climax in January, the month in which most storms occur, and dies away as the end of April approaches, for from May until November cyclones are almost unknown. Actually, really destructive storms do not strike the island very often—the last was in 1945—and they represent perhaps, an agricultural hazard no greater than such natural catastrophes as droughts, floods, hail or locusts in many other countries. Fortunately, all that need be said of cyclones in 1950 is that once again the bogey failed to put in an appearance.

After what has been said of the season, it may come as something of a surprise to learn that yet again a record sugar crop was harvested—the fourth record crop in succession. The total production of sugar was about 457,000 tons, an increase of roughly 41,000 tons or about 10 per cent over the previous record crop of 1949.

The area under cane was about 6,000 arpents* greater than in the previous year, but this alone does not explain the remarkable result. There was no change in the cane varieties grown—M. 134/32 remains dominant—and the new record crop must, to a considerable extent, be attributed to further improvements in field practice. Much of the cane land of Mauritius is strewn with massive volcanic boulders; the bulldozer has enabled more and more of these lands to be cleared of boulders and the clearance has made possible the use of mechanical equipment and more efficient methods of cultivation. This was probably an important contributing factor in the case of the 1950 record crop and those which preceded it.

It is probable, too, that the work of the extension service of the Sugarcane Research Station began to show results in 1950. Managers of sugar estates have expressed appreciation of the Field Demonstrators' efforts to improve the yield of cane from fields worked by small planters.

Twenty-seven sugar factories operated during the year, the highest output for one factory being 27,000 tons of sugar, the lowest 8,000 tons, and the average 17,000 tons. Rehabilitation of factories is proceeding well, but there is much to be done and the work will take a long time to complete. No new schemes for centralization of factories came into operation during the year and, indeed, it may be thought that there is not much further scope for centralization, at least for the present, in view of the very large tonnage of cane which is now being produced.

The continued reliance of the sugar industry on a single variety of cane—M. 134/32—is still a source of anxiety, although this variety is maintaining its vigour and its resistance to the main cane pests and diseases of the island. Other varieties, especially M. 112/34, are grown in certain well-defined localities but there is an urgent need for a general purpose type equal to or better than M. 134/32, and for varieties adapted to particular ecological conditions, particularly the cool, wet upland regions.

One new variety—M. 423/41, a product of the Sugarcane Research Station—was released for general planting during the year. In variety trials this variety has consistently given higher yields of cane and of sugar per acre than M. 134/32, but it appears to be slightly inferior in sucrose content per cent. of cane. Tests of two other promising varieties, M. 213/40 and E. 1/37, are now in the final stages of trial and they may be released next year. The latter is a cane bred by Highlands Sugar Estate and it promises to be well suited to the cool wet districts of the island.

Cane breeding work in general was continued actively, because production of new varieties is regarded as one of the prime necessities of the sugar industry.

* We still stick to our arpent, an old French land measure equal to about 1.04 acre.

The Central Board, which regulates relations between sugar planters and millers, continued its operations throughout the year—a year which proved to be one of the most difficult in its history. Up to and including 1949, the planters' share of sugar, as allocated by the Board, was based on two-thirds of the average extraction of the year in question and of the four preceding years. In 1949, as the result of strong representations from the planters, the Board decided that in future, starting with the 1949–50 crop, the allocation should be based on the extraction of the single crop year. This proved to be much higher than that based on the five-year average and, as a result, planters were provisionally allocated a greater share of the sugar from their canes, and the millers less. This, of course, did not please the millers, who have long maintained that the allocation of two-thirds of the sugar to the planter is unduly favourable to him. They also claimed that the soaring price of sugar bags, which has been rising ever since 1940, places the miller at a still greater disadvantage in relation to the planter. The millers therefore made a combined protest against the two-thirds basis of allocation. Eleven sugar millers also submitted individual objections against the provisional assessment of planters' sugar; one was subsequently withdrawn, but the others had to be heard by the Board.

The first of these appeal cases, that of Reunion Sugar Estate, was heard by the Board in April–May 1950, and resulted in the Board lowering the amount of sugar awarded to planters to less than two-thirds of the extraction. This did not please the planters, who maintained that the Board cannot award to planters less than two-thirds of the extraction of their canes—and indeed, at least to the layman, the law on this point is not as clear as it might be. In the belief that the action of the Board was *ultra vires*, the planters appealed to the Supreme Court to intervene in the case by writs of *certiorari* or *Mandamus*. The decision of the Supreme Court had not been announced by the end of the year and, consequently, no further appeals were held by the Board.*

As a result of the Millers' protest, a Committee was set up to review the method of allocation of sugar between planters and millers, and the question of the constitution of the Central Board was added to its terms of reference. The Board as at present constituted consists of representatives of millers and of large and small planters. It has given excellent service to the industry, but the constitution is open to objections which apply to all executive bodies composed of representatives of particular interest-groups. The Committee was therefore asked to make recommendations on the following matters: the constitution of the Central Board; the basic principles which should apply to the allocation of sugar between planters and millers; whether there should be a right of appeal against decisions of the Board.

* The judgment of the Supreme Court was announced early in 1951. It declared that the Central Board had acted within its legal rights in reducing the amount of sugar allocated to planters to less than two-thirds of the extraction. Planters' representatives are thinking of submitting the case to His Majesty's Privy Council.

The Report of this Committee had not been published by the end of the year.

The by-products of the sugar industry consist of molasses and alcohol distilled from molasses—for as yet there is no appreciable surplus of bagasse, though there may be such a surplus in the near future. The quantity of molasses produced in 1950 was over 100,000 tons, of which about 45,000 tons was used in local distilleries, the bulk of the remainder being returned to the soil as fertilizer. Permits for the export of some 1,650 tons of molasses were issued during the year. Most of this went to India but there was a small shipment to the United Kingdom. Negotiations were started with a view to developing large scale export of molasses and if these can be satisfactorily concluded the Colony will have a valuable additional source of income. Molasses does, however, contain a valuable quantity of potash—3 per cent to 4 per cent on the average—and if it is no longer returned to the soil this loss will have to be made good by additional imports of potash fertilizers.

About 5½ million litres of alcohol were distilled during the year of which over 4 million litres were exported.

Fibre

The main fibre plant of Mauritius is, of course, the so-called Mauritius hemp or aloë (*Furcraca gigantea*) which was introduced to the Island probably about 1750. Most of the fibre obtained from this plant is used at the Government Sack Factory for the manufacture of sugar bags. A little sisal is also grown and is utilized for making cordage within the Island, or it is exported.

The story of fibre during the year falls naturally into two parts; production and utilization.

Production of aloë* fibre continued to increase, mainly for two reasons. There was an increase in price which doubtless made it profitable to exploit areas of wild aloë which were previously marginal or uneconomic. The second reason was the successful biological control of the "black sage" (*Cordia macrostachya*). Some regions in which the fibre plants had been suppressed by this colonising shrub, or which were inaccessible because of its density, were cleared of it by the leaf-eating insect *Schematiza cordiae*, an importation from Trinidad, and became available for exploitation. The *Schematiza* is now being assisted by a seed-eating insect (*Eurytoma* sp.) which has established itself in several districts, and it would seem that complete control of the black sage is now in sight.

Production of fibre in 1950 was nearly 1,714 tons, of which 1,160 tons was supplied to the Government Sack Factory and 330 tons exported, the remainder being in store at the end of the year.

*It is convenient to use the shorter of its local names although the plant is not, of course a true aloë.

Practically all the aloe fibre was obtained from wild plants of which there are two quite distinct varieties in Mauritius; one is called aloe creole,* and the other aloe malgache†. The former is the commercial fibre plant; the latter is not normally used because the fibre content is very low, recovery being well below 2 per cent, but in 1950 leaves of this plant were actually harvested and used for fibre production to a limited extent.

There is, however, an increasing interest in plantation production of aloe fibre. According to figures collected by the Mauritius Hemp Producers Syndicate, a fairly large area of plantations (about 2,000 arpents) has already been established and a further 4,000 arpents will probably be planted. These plantations have been made, and future ones will no doubt be made, on land on which wild plants grow; but the area of wild growth is thought to be about 13,000 arpents and a good deal of this will remain. If all actual and projected plantations come into production, and if the remaining wild growth is cut regularly, a total annual crop of 5,000 tons of fibre should not be impossible.

The plantations are still too young to make any significant contribution to the fibre supply, though some small areas have been cut for the first time.

Aloe fibre is supplied to the Sack Factory either as raw or "brushed" fibre. In 1950, there was a very marked increase in the supply of brushed fibre. A bonus of 10 per cent over No. 1 raw fibre is paid for this grade, which may partly account for this increase. Producers were probably influenced also by high export prices; though permits to export are granted only after the needs of the Sack Factory have been met. Fibre for export has to be brushed, and the short fine fibres which are removed in the brushing process can be exported as tow, at prices which are now very attractive.

One of the main problems of the Mauritius Fibre Industry has always been to find a really satisfactory method of decorticating the leaves of *Furcraea*. This problem has not yet been solved but some useful progress has been made. A prototype machine, designed and constructed by Messrs. Robey and Sons of Lincoln on the order of Government was delivered and put through fairly extensive trials in October, 1950. The results of these trials were not altogether satisfactory and it is evident that a good many modifications will have to be made before the fibre-producer accepts this machine as the answer to his prayers. The main objection is a relatively high industrial loss of fibre. The machine, as at present designed, leaves six or seven inches at the butt end of the leaf undecorticated; nevertheless, the recovery of dry fibre was between 2.1 per cent and 2.2 per cent of the weight of leaf in several tests. This represents a usage of about 45 tons of leaf to produce one ton of dry fibre, as compared with 35 to 40 tons of leaf in the case of the usual method of decortication. The fibre produced by the machine requires no retting and is suitable for working in the Government Sack Factory.

* *F. gigantea* var *Willemeliana* Roem.

† *F. gigantea* Vent.

The most popular of the new decorticators is the Humbert machine, produced by a local inventor, which also gives clean fibre needing no retting. Industrial loss is less than in the case of the Robey prototype, but the machine has the disadvantage that it must be hand fed. It tends to twist the fibre, but the twist can be removed by "brushing"; this is another reason for the increase in brushed fibre. About thirty Humbert decorticators have already been installed in the fibre factories of Mauritius. Other local inventors have tackled the problem of alce decortication and some of their machines may yet rival the Humbert. The number of applications for patent rights in new decorticators is a good index of the interest which is being taken in the matter and it is, perhaps, not over-optimistic to hope that the solution of the decortication problem is not very far off.

Another contribution to the progress of the industry was the opening of a fibre research station at Richelieu. The first experiments were laid down in 1950 with materials from nurseries established the year before. These first experiments are designed to compare strains of plants collected from various parts of the Island, to find the most satisfactory spacing for alce in plantations and to investigate the effects of interplanting with "acacia" (*Leucaena glauca*). By the end of the year, the experimental plantations were making good growth and further nurseries had been planted for new experiments to be laid down in 1951. A collection of fibre plants, including sisal, *Sansevieria* and *Agave amaniensis*, has been started at the station and it is proposed to make trials with New Zealand hemp (*Phormium tenax*) in the cool wet upland districts.

The Government Sack Factory, where most of the Island's output of fibre is processed, had a successful year. The Factory worked 262 eighteen-hour days during the year and produced nearly 1,185,000 bags, each of eighty kilos holding capacity. This is the first time that output has exceeded one million bags.

The outlook, both as regards world fibre supplies and the prospects for local production, warrants a considerable increase in the productive capacity of the Sack Factory. This has now been made possible by the provision, from Development and Welfare funds, of a sum of Rs. 1,700,000 for additional machinery and enlargement of the building. Machinery has been ordered from the United Kingdom and it is planned to have the building programme completed by the time this new machinery arrives—which will be in 1952, we hope. The enlarged factory is designed to produce 1,500,000 bags in addition to the present output, but even when it is operating to full capacity the total output of bags will be less than half the number required for the present sugar crop. It may be, however, that by that time some at least of the sugar of Mauritius will be exported in bulk.

It has long been hoped that the fibre producers and the Sugar Industry would reach agreement regarding the marketing of bags. This hope seems to be in a fair way to being realised as the result of negotiations between the two parties. Agreement was reached and a

draft was submitted for the approval of Government in June 1950. This question is, however, linked with that of the future of the Factory, a matter which has been under consideration for some time. A Committee was therefore appointed to consider the draft agreement and to make recommendations concerning the future of the Factory ; this Committee had not completed its work by the end of the year.

Tea

One important development during the year was the creation of a Tea Committee (under Ordinance No. 51 of 1949) invested with executive powers enabling it to control the production and sale of tea in the Colony.

At its earlier meetings this Committee confirmed the decision of Executive Council concerning the four small and unsatisfactory tea factories. The owners were required to submit plans for the reconstruction of their factories and, after approval of the plans by the Committee, to carry them out within a reasonable period. This compromise was adopted as an alternative to Captain de Mowbray's recommendation that these factories should be closed, a measure which might well have been preferable from the point of view of efficiency of the Tea Industry but which was not considered to be practicable.

By the end of the year, all four factory owners had submitted reconstruction plans and three of these had been considered and approved by the Committee ; one factory had started rebuilding.

The Island's one modern factory was enlarged by the addition of new withering lofts and as a result its manufacturing capacity is now about 600,000 lb. of made tea a year.

Other major matters to which the Committee gave its attention were the institution of a propaganda campaign designed to increase local consumption of tea, and the formation of a tea marketing pool. A proposal to add to the Tea Ordinance a clause enabling a cess to be levied on tea, for the purpose of financing a propaganda campaign, was rejected by Legislative Council. Tea manufacturers were then asked to provide the funds voluntarily: they agreed to do so but on terms unacceptable to the Committee, including the condition that no more planting permits should be issued. In spite of considerable discussion on the subject of tea marketing and consideration of proposals for the formation of a marketing pool, the Committee had reached no decision by the end of the year.

Permits to plant a further area of 657 arpents in tea were issued during the year, but in fact only about 75 arpents were planted. The main reasons for this shortfall are, probably, scarcity of tea seed of good jat, shortage of labour in the tea-producing areas, and the fact that much of the land is covered with thick scrub which must be cleared before planting. Permits are valid for two years and it is probable that a good deal more will be planted before they become invalid.

Lack of good tea seed is the main factor limiting the establishment of new plantations. Introduction of seed from Malaya was discontinued because of the outbreak of Blister Blight there and efforts to obtain seed from Africa have not been successful. It looks, therefore, as if we must rely on our own resources. Seed-bearer plots have been planted by the Department and are making good progress but it will be some years before they will yield any considerable amount of seed. In the meantime, the area of old tea at Montille, which was reclaimed for seed-bearing in 1948, is giving an increasing supply.

Production of made tea increased again in 1950 and exports and imports were higher than in the previous year, as the following figures show :—

		1950	1949
Production of black tea (in lb.)	...	749,193	658,274
Imports	do	86,849	35,537
Exports	do	47,986	33,917

There are signs that consumption of tea within the Colony is increasing somewhat, but it still averages only about 1·6 lb. per head a year.

Since production is increasing more rapidly than internal consumption, and since significant quantities of tea are imported, some of the local product must be exported. Only one factory is at present manufacturing tea suitable for export and the price obtained by export is considerably lower than the tea would fetch on the local market. Consequently, this comparative loss has—in the absence of a marketing pool—to be borne by a single producer.

Labour remains a serious difficulty, especially to the larger growers. The difficulty arises to a large extent from the distribution of population. The tea growing areas are thinly populated and much labour has to be imported daily by motor transport; but even with this expedient it is sometimes impossible to meet the demand, especially at the height of the main plucking season.

The situation is one which, in the long run, can be satisfactorily met only by the establishment of permanent settlements in the higher regions.

Tobacco

An interesting development during the year was the production of tobacco for export to the United Kingdom. A local firm entered into agreement with the Tobacco Board to purchase leaf for export, the agreement being for one year in the first instance with an option of renewal for a further five years if exercised within two months of the arrival of the first consignment in the United Kingdom. Special permits were issued to growers wishing to produce tobacco for export and although the price was lower than that for the local market there was a considerable response.

A quantity of about 84,700 lb., mainly flue-cured "New Varieties" with some air-cured Amarello, was eventually shipped to and handled by a London firm of tobacco merchants. Reports on this consignment had not been received by the end of the year, and the option to renew the contract was not exercised within the stipulated time.

A consignment of 66,000 lb. of flue-cured and air-cured Amarello leaf was also exported to Madagascar, following negotiations with representatives of the tobacco trade from that island.

The amount of tobacco which growers are permitted to produce for the local market was considerably reduced in 1950 because the Board was obliged to dispose of some of its accumulated stocks. Unfortunately this reduction coincided with a poor season. Seed-beds were destroyed by heavy rains in March and April and the crop in the field was adversely affected by drought and cool conditions. Conditions improved towards the end of the season, but too late to be of much benefit, and both the yield and quality of the tobacco—especially the yield and quality of the "new varieties" which were grown in greater quantity than usual—were poor.

The unfortunate season, combined with increased usings of leaf by manufacturers, resulted in a much greater depletion of stocks than had been expected. Indeed, withdrawals of leaf from stocks held by the Board and in the manufacturers' stores were a record.

In view of the present stock position, and if the high rate of usage for local manufacture continues, it is unlikely that any tobacco will be available for export next year, even if a sufficiently profitable market can be found.

Food Crops

The payment of subsidies to growers of food crops was discontinued as from the end of June 1949, but the Food Production Board continued its other activities.

One result of the discontinuation of subsidies is that accurate figures of acreage for the crops formerly subsidised are no longer available. It was hoped however that the Agricultural and Cattle Census which was carried out in 1950 would give useful information about food crops but this hope was not realised. The results of the survey were disappointing and they failed to give a clear and reliable picture of the area and distribution of these crops. There are two main reasons for this failure; first the "enumerators" employed were not trained agriculturists and in many cases the task proved too much for them; second, the natural difficulties of conducting such a survey are very great. Food crops are grown mostly on small plots scattered over much of the Island, sometimes in pure stand, sometimes between the rows of cane or other crops, and the same piece of land may be used for three or even four different crops during the year. Consequently, the amount of work which an accurate survey involves is very great and observations must be repeated at intervals over a long period if an accurate picture is to be obtained.

One interesting finding which emerges from the survey is that a considerable area of smallholders' land—aggregating, according to the Census figures, about 13,000 arpents—suitable for cultivation of food or other crops, is in fact unused or abandoned. Some of this land is worked out, but it is probable that much of it was abandoned because the holdings became too small for economic cultivation as a result of repeated fragmentation.

It is evident from the reports of Officers of the Food Production Board* that there was in 1950 a considerable reduction of the area planted to food crops as compared with plantings in the two previous years—a reduction which may have amounted to 25 per cent or more. This was to be expected, partly because of the ending of the subsidies and partly because food crops compete with cane and at present prices the latter generally gives a higher cash return per acre.

In order to encourage the continued planting of food crops in spite of the loss of the subsidy the Food Production Board ordered a "mechanical unit" including heavy and light tractors and equipment. When it arrives, this equipment will be hired out to food growers, as cheaply as possible, for land preparation and cultivation.

Experimental work on food crops by the Agricultural Division of the Department was seriously handicapped by acute staff shortage. Financial provision was made in 1950 for the appointment of two Senior Agricultural Officers and for a number of other new posts but—except for the promotion of the Senior Agricultural Officer to Deputy Director in charge of the Division—no appointments had been made by the end of the year. Nevertheless, the work on food crops was maintained and some new work started; details will be found in the report of the Division. Much more work is needed—indeed, experimental work on which to base effective plans for food production in emergency might, in the present state of the world, be regarded as an urgent necessity—but it can only be carried out when the Division is fully staffed.

Livestock

Although the food crop part of the Agricultural and Livestock Census was a failure, the livestock survey was a success and the information collected gives a reasonably complete and accurate picture of the position.

It is now clear that the number of milk cattle is not, as had been feared, decreasing; on the contrary, there has been a considerable increase. There has, however, been a marked decrease in the numbers of herd cattle—herds kept on estates mainly for production of manure—and draught cattle.

Sheep and pigs have increased only slightly but the prolific and ubiquitous goat has doubled its numbers in the last ten years.

* Report of the Food Production Board for the year 1949-50.

These trends are illustrated in the following table:—

NUMBERS OF LIVESTOCK

Year	Bovines			Small Stock			
	Milk breed	Herd and Draught	Total	Goats	Sheep	Pigs	Total
1930 ...	19,891	11,978	31,869	—	—	—	—
1940 ...	17,835	11,242	29,077	27,077	1,909	3,165	32,151
1943 ...	28,620	11,035	39,655	—	—	—	—
1950 ...	32,143	8,139	40,282	53,561	2,013	4,009	59,583

The increase in number of cattle of the milk breed becomes even more significant when it is realised that, owing to shortage of meat, most of the young bulls are now slaughtered when they are about one year old. In the Census figures bulls with under 2 teeth number only 4,738 while heifers with under 2 teeth number 8,538. Heifers and cows of the milk breed may be slaughtered only on humane grounds or if they have become useless for breeding as a result of disease or age.

The total number of milk cows is now approximately 15,000. It is generally accepted that these cows, under the conditions in which they are kept, give an average milk yield of about 3 litres a day, a figure which has been confirmed to some extent by records for an experimental herd kept at the Government Stock Farm. It would therefore appear that the daily production of milk in the Colony is not more than 45,000 litres—which is rather less than 100 c.c. per head of population.

There is, however, no doubt that the Creole cow—the typical dairy cow of Mauritius—is potentially capable of much higher milk yields. At the Government Dairy, where such cows are kept under fairly good, but by no means ideal, conditions, they average 7·3 litres per day over a lactation period of 300 days—a total of 2,190 litres per lactation. There is much variation in the breed; one creole cow at the Government Dairy gave about 4,000 litres of milk over a lactation of 365 days. The limiting factor is, however, feed rather than breed. If the Island average could be increased to that obtained at the Dairy, the problem of milk supply would be almost solved.

There are four main reasons for the decrease in the number of herd and draught cattle—categories between which no clear distinction can be made. Pasture land formerly grazed by herd cattle has been invaded by the introduced weed “Herbe Condé” (*Cordia macroslachya*—now successfully controlled by biological means). Some herds became seriously infected with tuberculosis and were in consequence destroyed. Motor traction has in recent years tended to replace the draught animal. Lastly, Mauritius, in common with many other countries, has suffered from meat shortage and, since there is no restriction on slaughter of herd or draught animals, increasing numbers have been killed for food. In view of these factors the decrease is not very surprising.

Goat flesh is much eaten but this has not prevented the goat population from doubling itself in the last ten years, an increase which makes a valuable addition to the Island's meat supply. The local goat—like most of its kind—is a prolific animal which usually produces twin kids—and not infrequently triplets. A large goat population is to be regarded with suspicion, but there is no indication that the present numbers are causing serious damage to soil or vegetation in any part of the Island.

The sheep population appears to be very much the same as it was at the time of the 1950 Census but pigs are a little more numerous. Unfortunately, pigs were not included in the Census of 1943. At that time, as a result of the war-time food production campaign, considerable quantities of maize bran and sweet potatoes were available for pig feed and probably, many more pigs were kept. Since the end of the war, the numbers have declined.

The total number of livestock (excluding horses, which are not used for agricultural purposes, and poultry which was not included in the Census) is now about 99,865 as compared with 61,228 enumerated in the 1940 Census. With the destruction of "Herbe Condé" and the recovery of grassland and fodder areas a further increase is probable.

A considerable programme of work for the improvement of stock and, particularly, development of the dairy industry, has been drawn up, and a small beginning has been made. This work falls naturally under two heads; veterinary and animal husbandry.

During 1950 the main subjects of veterinary investigation were contagious abortion, particularly in the Government Dairy herd, tuberculosis in herd cattle and sterility in Dairy cows. Of particular interest is the discovery that most cases of sterility in cows and heifers are caused by ovarian cysts. When these are enucleated the normal sexual cycle is restored and conception usually follows service.

Animal husbandry work during the year included, in addition to collection of basic information, importations of stock for improvement of local breeds and heat-tolerance tests of cattle at the lower altitudes. One bull and six heifers of the Ongole breed were imported from India with the object of improving both the draught and beef qualities of the local herd cattle. Work on sheep has been started and flocks of pure and half-bred Blackhead Persians and of Dorsian sheep imported from South Africa have been established at the Palmar Stock-breeding Station. All these sheep run in the open and the flocks came through the dry season in good condition. A first importation of Anglo-Nubian milk goats was also made; these animals were obtained from England and they will be used to ascertain the effects of crossing with the local goat.

Goats are not at present used for milking and the introducing of a suitable type could add appreciably to the milk supply.

All heifers from the Government Dairy at Curepipe are now sent to the Palmar Stock Breeding Station at the age of about six months, after vaccination against contagious abortion with the vaccine S. 19. They are allowed to run out to pasture and are returned to the Dairy when they are four or five months pregnant. While at Palmar they are included in a series of heat-tolerance tests with the object of finding the type of animal most suitable for milk production in the hotter low-lying regions.

Severe culling of the herd at the Government Dairy, was carried out in order to get rid of all undesirable animals. Average milk production per cow showed a considerable improvement and in spite of the reduction of the herd the total milk output for the dairy increased by about five per cent. Average production per cow over the year was 3,370 litres, the average daily yield being 9.0 litres. The number of animals in milk is still too low but preliminary assessments of pregnancy indicate that there should be heavy calvings in the earlier part of 1951. Now that one important cause of sterility—very probably the most important—has been diagnosed, it is hoped that the calving rate will remain normal and that the proportion of cows in milk can be considerably increased. The young heifers running at Palmar appear to be free of ovarian cysts; they are coming into heat at the end of the second year and they conceive readily when served later.

Contagious abortion is still a cause of serious loss at the Dairy and 23.5 per cent of all calvings in 1950 were abortions. It is evident that much more work will be required before the disease can be eradicated from the herd.

Improvement of dairy stock is at present confined to grading up by the introduction of Friesian blood. With adequate feeding the cross-breds give a higher milk yield than the average Creole animal. Pure bred and three-quarter bred bulls are stationed at stud in various parts of the Island and an artificial insemination campaign, using semen from a pure bred bull, has been started in the South of the Island. About 740 cows were served at the bull stations during the year and about 200 were artificially inseminated. The response of the Indian cow-keepers to the artificial insemination campaign has been disappointing but their interest does seem to be increasing, judging by the number of requests received during the last three months of the year.

Selection within the Creole breed is likely to yield fruitful results but this, of course, is a very long-term policy and it will take many years to establish a line of proven bulls.

Provision has been made in the 1950-51 Development and Welfare Estimates for animal husbandry staff, including an Assistant Animal Husbandry Officer, three Livestock Officers and nine Propaganda Agents. When these officers have been appointed and trained in their work a drive for better feeding and management can be started.

One major difficulty, however, is scarcity of concentrates for animal feed. Concentrates are now being prepared at the Government Maze Mill, which has been placed in the charge of the Director of Agriculture, but the supply of ingredients is insufficient to manufacture

the full quantity which would be required if the Indian cow-keepers were willing to buy the necessary quantity for their cows. A scheme for production of legume and grass hay has been suggested and sites have been selected for the initial experimental work.

There is little more to report about animal diseases, except an anthrax scare. Owing to a sudden flare up of this disease in Madagascar, a shipment of slaughter cattle from that Island arrived towards the end of the year without a clean Bill of Health. The animals were immediately placed in the Quarantine Station at Fort William and then taken directly to the abattoir in lorries. The Quarantine Station was enlarged to deal with possible later arrivals but in fact all subsequent consignments were covered by clean Bills of Health, the animals being quarantined at the Madagascar Port of Vohemar for fourteen days and then vaccinated against anthrax before shipment. No case of anthrax was reported from the district of Vohemar itself, the area from which the cattle imported into Mauritius are drawn.

Agricultural Pests and Diseases

The main matter to be reported under this heading is further success in the control of the introduced weed *Cordia macrostachya*, a bush which had spread over much of the wild fibre area and the grass-land and fodder regions of the Island. The insect *Schematiza cordiae*, which destroys the leaves of *Cordia*, is now widespread and the weed pest has been defoliated and killed over large areas. The seed-destroying insect *Eurytoma* sp. has also become firmly established. With the two lines of attack in full operation complete control of *Cordia* seems to be assured. I have referred in other sections of the Report to the probable effects of this suppression of the pest.

The white grub of sugarcane (*Clemora smithii*) is commonly regarded as the most serious insect pest of cane in Mauritius though the combined efforts of the three moth borers probably caused more damage.

The Entomological Division has been making experiments with B.H.C. ("gammexane") as a soil insecticide against white grub. It has been found that application of this chemical to the soil before the adult period, either to the open furrows at planting time or to the soil surface in the case of established canes, causes a large reduction in the number of grubs—but, surprisingly, there was no corresponding increase in the yield of cane. The reason for this apparently anomalous result is not yet clear, but there are indications that appreciable loss due to white grubs occurs only when the population reaches a high level and it may be that the populations in the experimental fields were below this critical density.

Another attempt has been made to introduce the giant toad (*Bufo marinus*) to see if it can be of help in controlling white grubs. The original attempt was made in 1938 but the toad failed to become established in the localities in which it was released. A consignment of 75 toads was received from Trinidad in 1950 and all were released in one locality.

Introduction of several parasites of moth borers were also made from the West Indies, but the consignments were small. Larger importations will, it is expected, be made next year.

It is satisfying to report that the main cane variety, M. 134/32, which occupies more than 90 per cent of all cane land in the Colony, remained free from any serious outbreak of disease.

The Island of Rodrigues

The Natural Resources Board's report on Rodrigues was laid on the table of the Legislative Council at the end of 1949, and in 1950 the Committee appointed to review the Development and Welfare Plan recommended that a sum of Rs. 1,600,000 should be allocated for the development of the Dependency. "Development" is, perhaps, hardly the right word to use in connection with this overcrowded and eroding island; "rehabilitation" might be more appropriate. It will be a long, difficult and expensive task merely to save the soils from destruction and to ensure some means of livelihood for the still increasing population.

Population pressure has resulted in the opening up of much land which would normally be considered too steep for cultivation and the task of effectively protecting such land from erosion is one far beyond the abilities and resources of the cultivators. Anti-erosion works are now being constructed by an Agricultural Officer and a small staff. So far, initial protection has been provided over a total area of 162 acres at a cost of about Rs. 320 per acre. These works stood up well to the heavy floods which occurred during the summer. Provision was made in the 1950-51 Estimates for additional expenditure on erosion control and also for more staff: but no new staff had been appointed by the end of the year partly because there are no houses for them.

One of the problems of the Rodriguan cultivators is grain storage. Many of them are unable to retain a stock of maize sufficient to carry them from one crop to the next: they sell most of their surplus at a low price and have to buy some of it back at a high price later in the season. As a contribution towards the solution of this problem, an experimental maize storage scheme was started. Cultivators' grain was accepted for storage at the Agricultural Station and an advance of Rs. 10 was made for each 100 lb. of maize stored. The owners of the maize were permitted to withdraw, at any time during the dry season, 90 lb. of maize for each 100 lb. deposited, on refunding the advance of Rs. 10—the reduction of 10 per cent being to cover cost and loss in storage. For the small initial experiment, the grain was stored in drums, but a grain bin is now being constructed at the Agricultural Station so that the scheme can be expanded if it proves successful.

Fortunately, the climatic season of 1949-50 was very favourable. Good maize crops were reaped and the condition of livestock improved with the recovery of the grazing. Over 860 cattle, 5,640 sheep and goats, 2,120 pigs and about 467 dozen poultry were shipped from Rodrigues to Mauritius—a not inconsiderable contribution to the meat supplies of the Colony.

23rd August 1951

W. ALLAN,
Director of Agriculture.

Order of Appendices

Agricultural Statistics
 Sugarcane Research Station
 Central Board
 Agricultural Division
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 Veterinary Division
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 Tea Division
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Agricultural Statistics

1. Weather

Data for rainfall recorded at three stations and deviations from average temperatures at one of them are given in the Table below. The three Stations are representative of the main climatic zones of the Island; Pamplémousses is in the sub-humid zone, Curepipe is in the super-humid zone and Reduit is intermediate.

RAINFALL—(in inches)

Months	Expt. Station, Pamplémousses		Central Expt. Station (Reduit)		Royal College Curepipe		Tempera- ture at Reduit [†] °C
	Av* [‡]	Reg [†]	Av.	Reg.	Av.	Reg.	
Nov. 1949 ...	2.13	2.36	2.33	2.68	5.71	8.11	-0.5
Dec. „ ...	4.91	1.69	6.37	4.09	9.71	4.09	-0.5
Jan. 1950 ...	9.56	5.23	10.32	8.04	16.33	13.55	+0.1
Feb. „ ...	8.74	2.40	10.95	3.26	17.28	14.52	-0.6
Mch. „ ...	9.32	11.02	11.94	13.79	19.31	31.00	-0.6
April „ ...	5.96	6.57	5.41	10.46	12.39	20.76	-0.9
May „ ...	4.48	2.57	4.24	2.96	9.86	11.08	-0.9
June „ ...	3.43	2.43	3.11	4.05	7.47	11.03	0.0
July „ ...	2.93	1.55	2.75	3.17	8.57	11.03	-0.8
Aug. „ ...	2.59	0.98	2.47	1.46	7.79	8.06	-0.1
Sept. „ ...	1.83	0.76	1.71	1.54	5.78	6.28	-1.0
Oct. „ ...	1.95	0.95	1.91	0.67	4.52	3.53	+0.2
Nov. „ ...	2.13	0.18	2.33	4.77	5.71	3.79	-0.4
Dec. „ ...	4.91	1.86	6.37	3.58	9.71	12.00	+0.2
TOTAL ...	64.87	40.55	72.21	64.56	135.14	158.83	—

*Read: Average for Av

†Registered for Reg.

‡Departure from Average

A general note on weather during the year is given in the section of this Report dealing with the Sugar Industry.

2. The Sugar Crop

		<i>In 1950</i>	<i>In 1949</i>
Amount of cane crushed, in metric tons	...	3,719,674	3,361,000
Average sugar extraction % cane	... ..	12.27	12.40
Total amount of sugar produced, in metric tons		456,726	416,000
Area under cane in 1950	... ..	163,578 arpents	
Area of cane harvested in 1950	... ..	151,028 ..	

All sugar available for export was bought by the Ministry of Food of the United Kingdom Government. The total quantity exported in the calendar year 1950 was 359,107 metric tons; local consumption amounted to 19,967 metric tons, of which 10,589 tons was white sugar and 9,378 tons was raw sugar.

3. Imports of Agricultural Machinery and Fertilizers

The quantity and value of agricultural machinery imported in 1950 are summarised in the Table below;—

						<i>C.I.F. Value</i>
						<i>Rs.</i>
Tractors	...	...	...	No.:	27	1,372,897
Tractor parts	...	...	...	—	—	6,033
Ploughs	...	...	...	3	3	12,493
Plough parts	...	...	...	—	—	22,019
TOTAL						1,413,442

Of the tractors, 21 were imported from the United States of America, 5 from the United Kingdom and one from France.

The following quantities of fertilizer were imported (figures obtained from the Chamber of Agriculture).

Nitrogenous fertilizers :—

	<i>Tons</i>	<i>Imported from</i>
Sulphate of ammonia	... 14,304	U.K. and Belgium
Nitrate of soda	 7,027	Chile

Nitrogenous and Potash fertilizers .—

Chilean nitrate of potash	... 1,004	Chile
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Potash fertilizers :—

	<i>Tons</i>	<i>Imported from</i>
Muriate of potash	... 2,546	France

Phosphatic fertilizers :—

Phosphatic guano	... 2,820	
Superphosphate	... 101	Holland

The phosphatic guano is obtained from the Dependencies of Mauritius and from the Seychelles.

4. Tobacco

Area cultivated to tobacco :—

		<i>Arpents</i>
Flue-cured	... ..	492'53
Air-cured	:	192'29
TOTAL	... ..	684'82

Quantity and value of tobacco produced :—

		<i>Quantity in kilograms</i>	<i>Value in Maurilius Rupees Rs. c.</i>
"New Varieties", flue-cured	... ..	113,899'4	287,060 31
Amarello, flue-cured	... ..	59,979'1	139,100 39
Amarello, air-cured	... ..	149,558'0	215,237 32
TOTAL	... ..	323,436'5	641,398 02

Amount of leaf used for manufacture in the Colony :—

		<i>Kgs.</i>
Local leaf	... ..	411,473'45
Imported leaf	... ..	90,756'25
TOTAL	... ..	502,211'70

Exports of leaf tobacco :—

	<i>Flue-cured "New Varietle"</i>		<i>Flue-cured Amarello</i>		<i>Air-cured Amarello</i>	
	<i>Quantity Kilos</i>	<i>Value Rs.</i>	<i>Quantity Kilos</i>	<i>Value Rs.</i>	<i>Quantity Kilos</i>	<i>Value Rs.</i>
To Madagascar	...	—	22,500	74,500	7,500	18,000
To United Kingdom	...	38,499 149,719	—	—	7,126	18,359

Total exports amounted to 75, 625 kilos valued at Rs. 260,578.

5. Fibre

The total production of fibre from the 38 decorticating factories was 1,713,517 kilos of which 330,266 kilos was exported. There was also a production of 66,711 kilos of tow, of which 18,061 kilos had been exported by the end of the year.

Consumption of fibre at the Government Sack Factory and the amount of its products were as follows :—

Fibre received at the Factory	... ..	1,159,884 kilograms
Fibre processed at the Factory	... ..	1,226,939 ..
Number of sugar bags produced (each of 80 kilograms capacity)	... ..	1,184,467 bags
Amount of filter-press cloth produced	... ..	49,573 yards
Other cloth	... ..	424 ..
Quantity of fibre used for rope manufacture	... ..	34,452 kilograms

6. Tea

Tea area under tea at the end of the year was approximately 2,065 arpents. Production amounted to 749,193 lb. (English) of made tea, an increase of 90,919 lb. over the figure for the previous year. It is interesting to note that production of tea in 1950 was almost five times as great as it was in 1940.

Permits to plant a further 657 arpents of tea were issued.

Exports of tea amounted to 47,986 lb. (English). This went mainly to the United Kingdom, the Union of South Africa and the United States of America.

7. Vegetable Oil

Innova Limited produced 1,247,662 kilos of refined coconut oil and manufactured 261,275 kilos of soap.

8. Import of Livestock

CATTLE

From Madagascar	...	...	4,415
From Rodrigues ...	...	...	622
			5,037

SHEEP AND GOATS

From Rodrigues ...	...	...	* 5,392
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PIGS

From Rodrigues ...	...	...	2,377
From Other Dependencies	...	...	2
			2,379

POULTRY

			<i>Dozen</i>
From Rodrigues ...	...	...	470
From Other Dependencies	...	...	12
			482

HORSES

Race horses from the U.K.	...	19
Riding horses from France	...	4
Riding Horses from S. Africa	...	2
		25

9. Alcohol

The return of alcohol distilled during the year 1950 was 5,532,202.5 litres of which 4,146,517 litres were exported.

Sugarcane Research Station

Cane Breeding Division

Weather conditions were, on the whole, unfavourable for hybridization and seed setting in 1950. There was a scarcity of arrows in the breeding plots, particularly at Pamplemousses Experimental Station. The total number of crosses made at Reduit and Pamplemousses was 185, as against 224 in 1949.

Fuzz fertility was lower than usual. A considerable number of crosses produced no seedlings at all, particularly at the beginning and end of the crossing season. In all, 23,000 seedlings have been obtained, as compared with 40,000 the previous year.

The seedlings in the glasshouse at Reduit made slow growth due to the cold and protracted winter and, as a result, transplanting to pots was delayed. Damping-off disease occurred in some of the seedlings pans at Reduit despite the careful control of waterings; the disease disappeared as soon as growth conditions reverted to normal.

Field plantations of the 1950 seedlings commenced during the first fortnight in December, but could not be completed at the end of the year due to shortage of irrigation water at Reduit and Pamplemousses. Approximately 20,000 seedlings had been transplanted at Reduit, Hermitage and Pamplemousses by the beginning of January 1951. As usual, sprouted single-eyed cuttings of the standard variety M. 134.32 were planted in the border and middle of each row of the seedling plots.

Selection from the hybrid seedling populations was made in plant cane at Hermitage and in ratoon at Reduit and Pamplemousses; 285 seedlings were retained for testing in second-trials.

A large number of routine second-trials of the usual exploratory type has been harvested in virgin and ratoon. All trials laid down with the new type of layout as described in last year's Annual Report, were allowed to grow in second-ratoon and selection of the most promising seedlings will be carried out in 1951. It would appear that the new design will allow of sound ratooners being more quickly sorted out.

Sixthird-trials have been planted and eight harvested. No seedlings have been retained from the plant canes, as the policy is to select in first-ratoon and even in second-ratoon, should space be available.

Due to the large number of variety trials laid down the previous year, it was decided to plant about 8 new trials in all, to test mainly newly bred seedling canes. Fifty-one trials have been harvested on estates, and 3 at the Experimental Stations during the crop season. Considerable data of the performance of the Barbados Varieties, E.1/37, M. 213/40 and M. 423/41 have been obtained under a diversity of environmental conditions.

Although it had been decided to release M. 423/41 for commercial growing in 1950, variety trials containing this cane variety were reaped in order to obtain further data of its ratooning capacity.

Milling tests were performed on the varieties M. 213/40 and E.1/37 in cooperation with the Central Board and Sugar Technology Division of the Department of Agriculture in view of their probable release in 1951.

The results obtained with the Barbados canes are interesting and tend to indicate that one or two of them may prove to be competitors with M. 134/32, although nothing definite can be said before their ratooning qualities will have been gauged. B. 37161 gave better results in plant cane than in ratoon, B. 34104 and B. 37172 crop well in first-ratoon, and the former is probably the more acceptable variety for all-round purposes. B. 3337 is a heavy yielder in virgin and first ratoon, but its juice qualities leave somewhat to be desired. B. 4098 and B. 3439 are inferior canes.

The distribution of M. 423/41 to planters commenced in August and covered the whole crop period. Approximately 185,415 canes have been sold to planters mainly from propagation plots planted on the larger estates. It is gratifying to record the interest which the planting community is showing in this new cane variety.

The following varieties have been imported from Canal Point, U.S.A., and planted in the quarantine glasshouse at Reduit:— C.P. 34-120, C.P. 36-13, C.P. 36-105, M. 336, M.L. 3-18 and P.R. 905. The cuttings of C.P. 34-120 were destroyed as this variety had already been introduced from South Africa.

A few cuttings of several Mauritius varieties have, on request, been exported by air to India, Pakistan, Ceylon, Natal, Reunion and Madagascar. Planting material of several other varieties were, in addition, despatched to Reunion and India for breeding purposes. No fuzz has been exported.

The three Latin Squares laid down to test whether a significant difference in yield of cane and sucrose can be correlated with the source of planting material of M. 134/32 were harvested. The results showed, *inter alia*, that the cuttings obtained from Hermitage Experimental Station gave significantly lower yields of cane at Réduit and Hermitage. At Pamplemousses the cuttings from Hermitage also produced the lowest cane tonnage, but the differences between the various sources were non-significant. With regard to the refractometric Brix, there was no difference between any of the sources in the three experiments.

Investigations on the use of Aretan at varying concentrations as a preservative for male arrows were carried out on a small scale. The results are promising but must be considered as preliminary.

A. DE SORNAY,
Plant Breeder.

Chemistry Division

The factorial NPK experiments were harvested this year in fourth ratoons, and yielded the following results:—

- (a) The application of 30 kilograms of Nitrogen produced an increase of 37 per cent in yield of cane. A supplementary dose of 30 kilograms of Nitrogen produced an additional increase of 15 per cent.
- (b) No individual response to phosphate application was observed and the average response amounted to 0.7 tons per arpent.
- (c) Two trials responded significantly to potash application; the average response for the series was 1.3 tons per arpent.
- (d) Average sugar analyses for five crops, in this series of experiments show a marked decrease in sugar content of canes receiving increased applications of Nitrogen. Phosphate and Potash do not seem to have a very marked effect on sugar content.

In the series of Lime Trials no significant response was obtained by the application of either Potash or Magnesia. One trial out of four responded significantly to Lime.

The Basalt experiment at Hermitage was harvested in second ratoons. The results of the virgin and the two ratoon crops are given below in tons of cane per arpent:—

	No. basalt	91 tons basalt per arpent	182 tons basalt / arpent
Virgin 1948	31.9	33.5	36.3
1st Ratoon 1949	26.7	29.8	32.5
2nd Ratoon 1950	32.4	34.2	37.2
TOTAL for 3 crops ...	91.0	97.5	106.0

From the above figures, it is seen that single application of crushed basalt at 182 tons per arpent before planting has produced an increase in cane yield amounting to a total of 15 tons of cane per arpent for 3 crops.

It will be interesting to see how long this cumulative effect of basalt on cane yield will last, and also how long it will take to repay the cost of application of the basalt.

Commercial cane sugar determinations once more suggest a slight increase on sugar content with basalt application:—

	No basalt	91 tons basalt p.a.	182 tons basalt p.a.
C.C.S. % cane ...	11.18	11.44	11.30

Foliar diagnosis studies did not reveal any appreciable difference between the varieties M. 423/41 and Ebene 1/37 as compared to the standard M. 134/32.

S. M. FEILLAFÉ,
Acting Chemist, Sugarcane Research Station.

Botany Division

Due to the departure of the Assistant Botanist on study leave to Eugland in July, research work in the Division had to be considerably curtailed.

No new experiments on weed control have been carried out. Of the three trials laid down in 1949 at Labourdonnais, Benarès and Ferney, to test the effect of pre-treating sugarcane setts on yield of cane, only the one at Labourdonnais has been completely harvested. The trial at Benarès and part of the one at Ferney were harvested by these estates themselves through an oversight. The results of the trial at Labourdonnais showed that there was no significant difference between the control and any of the treatments. So few recruits (one to two cuttings per plot) having been planted, no conclusions can be drawn with regard to the incidence of pine-apple disease. In the case of Benarès trial pine-apple disease incidence was much higher in the case of the control plots. At Ferney, the control and the plots treated with 10 per cent lime solution were more badly infested with the disease than the other plots.

Five new Latin Squares have been laid down to study the effects of interplanting foodcrops with sugarcane in different localities. Three of the trials laid down the previous year, have been harvested in plant cane and one in 1st ratoon at Fernay, with erratic results. The foodcrops included in these trials were maize, groundnuts, dhol Kessari and tomatoes.

Field trials on secondary crops have been continued, and manurial experiments on oats, linseed, sweet potato, groundnuts and rice laid out. The rice trial failed completely due to serious leaf spotting caused by the fungus *Helminthosporium* and the disease known as "sterility in rice". Three linseed variety-and-time-of-planting trials, and a spacing trial were harvested with interesting results.

A potato variety trial was laid down at Hermitage to test two new varieties namely, 134 and Up-to-Date. Germination was considerably affected by grub attack and adverse weather conditions. The plants recovered afterwards and made good growth, but, unfortunately, a severe outbreak of blight and leaf-roll disease completely destroyed the Up-to-Date variety after the tubers had formed. Though 134 outyielded Up-to-Date, its tubers were subject to rotting during storage.

Propagation plots of a wheat variety, supplied by the Director of Agriculture, were planted at Réduit and Hermitage. Germination tests in the laboratory showed that the seed was of very low viability. The plot at Réduit failed completely due to this reason and to the dry conditions being experienced after planting. The few seeds that germinated at Hermitage gave rise to seedlings which established themselves fairly well but which at the time of flowering were attacked by "cereal scab". In view of these results it has therefore been decided not to recommend the seed of that variety for propagation.

The propagation of several varieties of Sorghum is being pursued.

Extension Service

The work of the Extension Service during the first six months of the year was conducted by a Senior Field Demonstrator with the help of six Field Demonstrators. At the end of June the Senior Field Demonstrator left the Colony on leave and was replaced by the writer.

The work carried out may be summarised as follows:—

- (a) *Enquiries.* Investigations were carried out in the case of 30 shopkeepers who applied to the Controller of Supplies to obtain permits for sale of fertilizers. The main object of delivering these permits, is to allow the vegetable growers of different regions of the Island to take delivery of the fertilizers required by them in their village instead of at Port-Louis.
- (b) *Phosphatic Guano.* Small planters being now conscious of the beneficial effects of applying this fertilizer to their canes, the stock in hand was not sufficient to meet the demand thereof. The attention of the Acting Chemist, Department of Agriculture, and the advisory Board of the Controller of Supplies was therefore drawn to the fact and the importers of phosphatic guano were approached with the view of increasing their stock next year.
- (c) *Meetings.* Eighty five meetings were held in co-operation with the Co-operative Credit Societies. The Presidents and Secretaries of these Societies were asked a fortnight before to convene the maximum members, whether belonging to the C.C.S. or not. The chief item dealt with at these meetings purports to the modern methods of sugarcane cultivation. Apart from giving advices to cane growers, the Field Demonstrators have also contracted vegetable growers. Demonstrations were carried out with the different insecticides and fungicides used to combat the commoner insect pests and diseases of vegetables.
- (d) *Demonstration Plots.* Thirty three manurial demonstration plots have been harvested during the year and 13 new plots laid down. Fourteen variety trials have also been laid down, 9 of which with the varieties M.134/32 and M.423/41, and the others with M.134/32, 423/41 and E.1/37.
- (e) *Weed killers.* Thirty demonstrations of chemical weed control have been made on small planters' land. A large number of planters took much interest in weed control problems.
- (f) *Distribution of a new variety of cane.* This Division was responsible for distribution to planters and Estates all over the Island of a total number of 185,415 canes of the variety M.423/41. These canes were obtained from Propagation Plots and Variety Trials on different Estates.
- (g) During the crop season, one of the Field Demonstration was attached to the experimental cane mill for the analysis of all cane samples collected by the Sugarcane Research Station.

JACQUES MARROT,
Acting Senior Field Demonstrator.

Central Board

In 1950, the Central Board was set up with Mr. N. Craig, Deputy Director of Agriculture, as Chairman, together with the following members :—

Millers' (Mr. A. Wiéché, Factory Manager, Labourdonnais S.E.
Representatives (Mr. E. Jullienne, Manager of Réunion S.E.

Big Planters' (Mr. P. Lagesse of Grande Rivière Estate.
Representatives (Mr. M. Souchon of Espérance Estate.

Small Planters' (Hon. A. M. Osman of Notre Dame.
Representatives (Hon. D. Luckeenarain of Stanley.

Mr. E. Jullienne resigned in April and Mr. Francis North Coombes was appointed in his stead. Mr. N. Mc. Gregor replaced Mr. P. Lagesse who left the Colony in June. Mr. Paul L. Nairac was appointed legal adviser to the Central Board in March.

Meetings of the Central Board

The Board held 26 meetings during the year. The main business dealt with was as follows :—

2	meetings relative to assessment of planters' sugar
9	" protest against assessment of planters' sugar
7	" application for changes of delimitation
2	" disputes between millers and planters
3	" cost of transport of canes
1	" enquiry into dealings of middlemen
2	" general business.

Registration of Cane Contracts

The number of cane contracts received for registration during the year amounted to 7,290. The total number of contracts registered at the Central Board and in force for the 1950-51 crop amounted to 11,720, referring to 16,300 planters, out of which 7,920, referring to 12,480 planters, were on a provisional basis.

Delimitation of Factory Areas

Thirty four applications for changes of delimitation of factory areas were received. In 12 cases* the requests were granted. As a result of the closing down of the factory of Savannah the lands formerly forming part of the factory areas of Savannah and Savinia were included in a single factory area. The factory of Sans Souci closed down after the 1949 crop and the canes formerly crushed by that factory are now manipulated by Union.

Sugar Factory Licences

Permits were issued to the 27 factories which operated during the year. New plans of factory areas were supplied to the factories whose factory areas had been altered.

Permits to Middlemen

Forty-three permits were delivered during the year against 36 in 1949. After enquiry the Board decided not to renew the permit of one of the middlemen after the 1950-51 crop for not acting in accordance with the terms of the Sale of Canes (Control) Ordinance No. 47 of 1941.

Investigations

Fifty investigations were carried out relative to delimitation of factory areas and to disputes between Millers and Planters. In several cases disputes were settled amicably.

Control of Cane Weighbridges

A total of 165 weighbridges dealing with planters' canes have been tested during the year. 117 were found to be accurate and in good working order on first inspection. Thirty seven weighbridges were found to be inaccurate and had to be re-adjusted so as to conform to the standard of accuracy laid down in G.N. No. 92 of 1942. A further 11 weighbridges were found to be in bad working order and had to be re-examined. Of these 10 were found accurate at the second examination and one had to be examined a third time. The Weighbridge Inspector decided that four old obsolete weighbridges should be replaced by new ones. One new Ashworth Automatic scale was installed.

Two hundred surprise checks were carried out at the various weighbridges and 291 vehicles which had previously been weighed were reweighed. Only in two cases the weight recorded was not the true weight and the responsible weighers were prosecuted.

Cost of Transport of Canes by Road and Tramway

In addition to the normal working of costs for the transport of canes by tramway further costs were worked for canes conveyed by road. The resultant data produced is *prima facie* evidence that the latter method is more economic (by about 30 per cent) but the problem of transporting all canes by road would appear to be a weighty one and includes the expansion and re-planning of factory yards together with improved unloading facilities. However, there would appear to be an obvious tendency in this direction, especially amongst planters.

Cost of Production

During the year under review, a further study of milling costs together with costs of large and small planters were made showing also the distribution of profit between the two parties.

Cane Testing

Due to limited staff, it was only possible to carry out sucrose content tests in 18 factories. In two factories equipped for the accurate weighing of mixed juice and imbibition water sucrose content tests were carried out on representative samples of all canes manipulated (including estate canes). The results obtained as compared to factory

figures were very satisfactory. Five automatic juice scales, one automatic water scale and one Leinert Water Meter were installed prior to the crop. Under Ordinance No. 4 of 1948, all factories crushing planters' canes should have been equipped with scales for weighing juice but that was not possible due to delays of delivery in U.K.

Assessment of Planters' Sugar

The policy adopted by the Board previously of assessing planters' sugar on a five-year average was altered and the yearly extraction was taken into consideration. Hardly any protests were received from planters concerning the preliminary assessment made by the Board for the 1949 crop. On the other hand, all the millers, with two exceptions, protested against the method adopted by the Board for assessing planters' sugar and submitted that cost of production of cane, cost of manufacture of sugar, cost of bagging and transport of sugar to Port Louis should have been taken into consideration by the Board in assessing planters' sugar. Eleven millers objected to the awards made; later on, one of the millers withdrew his objections and a second one requested the Board to take into consideration the question of efficiency of the factory and not the original points raised.

The first case which was heard was that of Réunion Limited. The Board after hearing the evidence and arguments put forward by the miller as well as by the planters and taking into consideration all relevant circumstances, reduced the original assessment of 85 kilograms of sugar per ton of cane to 81 kilograms.

The planters' representatives submitted that under the terms of Article 6 (2) of Ordinance No. 47 of 1941, the Central Board was not empowered to give to planters, on an average, less than two-thirds of their extraction. That contention was not accepted by the Board which was of the opinion that they had the power to assess to planters less than two-thirds of their extraction whenever circumstances of the particular case appear in the opinion of the Board to justify such an action. The planters' representatives subsequently asked the Supreme Court to interfere in the question by way of *certiorari* and/or *mandamus*. The Central Board is awaiting the decision of the Supreme Court before proceeding with the other cases.

The majority of planters have expressed the wish that the present policy of the Board, whereby planters delivering canes at the factory yard receive somewhat less than two-thirds of their extraction and those delivering at a distance from the factory and having to bear a high cost of transport, receive somewhat more than two-thirds, should be modified and that each planter should pay his own transport. The question was considered by the Board under its various aspects; the Board came to the conclusion that the method whereby each planter would pay for his own transport would have the following advantages:—

- (a) simplicity and ease of operation;
- (b) lowering of total cost of transport of planters' canes;
- (c) beneficial to majority of planters.

On the other hand, the following points would have to be considered :—

- (a) the congestion in the factory yard ;
- (b) extra capital expenditure to provide for the increased factory yard handling ;
- (c) transport would be more dependent on lorries ;
- (d) a number of planters might have to pay a prohibitive price for transport ;
- (e) it would be necessary to revise completely the delimitation of factory areas.

No decision has yet been taken by the Central Board in the matter.

Varieties of Canes

The variety M. 423/41 was added to the list of varieties which may be planted and propagated in the Colony. Sucrose content tests were carried out in factories on a number of cane varieties produced by the Sugarcane Research Station.

Appointment of an *ad hoc* Committee

In June, a Committee was appointed by His Excellency the Governor to make recommendations to Government on the following matters :—

- (a) the constitution of the Central Board ;
- (b) the basic principles relative to sugar division ;
- (c) the question of the grant of a right of appeal against decisions of the Central Board.

The Committee have not yet tendered their report.

R. AVICE,
Registrar, Central Board.

Agricultural Division

Staff

The staff strength of the Division was reduced throughout most of the year to a minimum. The Division was short of two Agricultural Instructors and one Agricultural Officer, while the Senior Agricultural Officer in addition to his normal duties acted as Deputy Director of Agriculture. On 15th December he was appointed Deputy Director, a post newly created in view of the extension of the Division's activities. Mr. E. Lesur, Agricultural Officer, acted, in addition, as Government Tobacco Officer. Mr. L. Moorlee, Agricultural Instructor, was on vacation leave from February to June. In September, Messrs. S. Bagwant and E. Farla were appointed Agricultural Instructors.

Among the Overseers, only the following changes occurred: Mr. C. Boolkah was posted to the Royal Botanical Gardens and replaced on the Allotments by Mr. G. Leclerc.

Experimental Stations and Nurseries

The three experimental stations were maintained in working order. The results of the various trials carried out and the experimental work done are recorded in other sections of this report. The Central Experimental Station at Réduit continued to fulfil its role of stock maintenance, mainly of variety collections of food crops. Part of the land available was also devoted to the production of seeds of acclimatised vegetables both of the European and the tropical types. Towards the end of the year work began, at that station, on the construction of a small reservoir of about 30,000 cubic feet capacity to store during the night water which was allowed hitherto to run to waste. This reservoir is part of a scheme to improve irrigation at the station and to bring under cultivation more land which it is hoped will be made available for further experimental work under Development and Welfare funds.

At Pamplémousses and Barkly Experimental Stations work proceeded on the same lines as last year. Roads and main paths were improved and re-surfaced at Pamplémousses; a new cart road was opened in order to by-pass the adjoining Botanical Gardens when removing the cane crop from the experimental fields to the neighbouring factory of Beau Plan. Work began on three new huts for housing the labourers attached to the Gardens while the old camp was repaired and rethatched.

At Barkly, a small new reservoir, brick-lined and with a concrete bottom, has been built with a view to facilitate the irrigation of a part of the station hitherto difficult to water. It is hoped that this reservoir

will be enlarged in the future if more land is made available under Development and Welfare. The third section of service roads was terminated, thus completing the station's road network begun in 1949. This and the creation of the reservoir have made it possible to bring under more intensive use another 8,000 square ft. of land: not much, forsooth, but extremely valuable.

Gardens and Nurseries

The Division continued to assume responsibility for the upkeep and improvement of the Royal Botanical Gardens at Pamplémousses, and Telfair Gardens at Souillac. Telfair is continually subjected to sea spray in windy weather and extremely difficult to keep in good trim, especially with the limited amount of money available. It is a favourite resort for pic-nics in the South of the Island. Pamplémousses is striving hard, and successfully, to maintain its past reputation as one of the foremost botanical gardens of the world. It has not been possible to complete the new lake, but funds have been asked to line it with cement bricks and to turn it into a storage tank for the irrigation of the mango orchard.

Nurseries for the propagation of fruit and ornamental plants not only for sale to the public but also to supply Government institutions and to meet the normal replacements at the Gardens were maintained at Abercrombie, Barkly and Pamplémousses.

Plant Introductions

From the above nurseries seeds are collected for exchange outside the Colony. In this alone, the Pamplémousses Gardens fulfil a small but useful role. Among the species of plants sent to various correspondents abroad, the following may be mentioned:—

Sorindeia Madagascariensis, *Latania Verschaffeltii*, *Vetchia* sp., *Petrea Volubilis*, *Latania Commersonii*, *Latania Loddigesii*, *Acanthophoenix crinita*, *Ixora coccinea*, *Pelthophorum ferrugineum*, *Dictyosperma furfuraceum*, *Roystonea regia*, *Adonidia merillii*, *Dictyosperma alba*, *Hyophorbe amaricaulis*, *Cassia fistula*, *Indigofera endecaphylla*, *Hydnocarpus Wightiana*, *Pandanus* spp., *Albizzia procera*, *Agathis robusta*, *Vangueria Madagascariensis*, etc. etc.

In exchange, the following among the more important were received:—

Three varieties of Soya from the U.S.A.

Six varieties of *Bougainvillea* from Batavia, of which three were saved.

Two strains of *Subterranean clover* from New South Wales.

Four varieties of luxury rice from Madagascar and one from Réunion.

Seeds of *tomato* Stonor M.P. from England.

One variety of *onions* from India.

Purple *Vetch* from Palestine

Field *pea* from Palestine

Three varieties of *Cauliflower* from England, two from France and one from India.

Cabbage seeds from India.

Thomea arborescens from South Africa

Echinocactus ingens from Mexico

Bismarkia medina nobilis from Madagascar.

Plant Propagation

The attempt to develop still better methods of grafting the principal fruit trees growing in the Island has continued, although on a somewhat smaller scale owing to shortage of staff.

(a) *Mango*. Experiments begun in 1948 and continued in 1949 have led in 1950 to the final adoption of the Malayan patch budding method used with Hevea. This is successful with mango under our conditions to the extent of about 50 per cent and is, therefore, extremely advantageous as compared with approach grafting which makes a heavy demand on labour for maintenance. The percentage of success of patch budding, however, is low with certain varieties and in this field more investigation is called for. So far little success has been achieved with varieties *Baissac* and *Aristide* which are both very popular dessert fruits. It was also found that a considerable amount of dexterity was essential and some of the operators had to carry out literally hundreds of buddings before acquiring the skill necessary for success. Nevertheless for the first time in the history of plant propagation in Mauritius, budded mango plants could be offered for sale to the public in 1950. Altogether, 164 budded plants were sold, 130 at Abercrombie and 34 at Barkly.

(b) *Peach*. A new and successful method of grafting peaches has been devised. It was sufficiently successful from the first, to enable us to discard the side-grafting method in use during the last four years. The new method will be more fully described in another publication. Its principal advantage lies in the fact that if the scion fails to strike, the same stock can be grafted again and again, which was not possible formerly.

(c) *Litchi*. Grafting of litchi (*litchi sinensis*) on longane (*Euphoris longane*) had been attempted experimentally last year in an effort to cut down the large demand for labour which layering litchis makes on the nursery personnel. Unfortunately, the results have been very

disappointing and there seems no hope so far of breaking away from the old method, which although quite satisfactory from most points of view, is laborious and costly in these days of high labour costs. If, however, experiments just initiated to graft litchi on litchi prove sufficiently successful, the process will be adopted on a practical scale and propagation by layers reduced or abandoned.

(d) A number of other fruit trees have been vegetatively propagated either as a matter of routine to meet normal demand or experimentally. It has now been established that good results could be obtained with Kaki (Japanese persimmon or *Diospyros kaki*) by germinating root cuttings in the solar propagator.

(e) *Eupatorium pallescens*. Now that Herbe Condé (*Cordia macrostachya*) has been practically wiped out biologically, it has been found necessary to grow *Eupatorium* in greater numbers in order to provide food for the scoliid parasites of *Phytalus*. It has devolved upon this Division to propagate this plant for sale to sugarcane planters. During the year 26,500 plants were raised, mostly at Barkly, as compared with 10,000 plants the previous year.

The following figures give the number of the more important fruit trees propagated during the year :—

	<i>Propagated</i>			
Avocado (grafts)	...	...	...	42
Avocado (seedlings)	...	...	...	738
Breadfruits	...	...	...	491
Citrus (all varieties, seedlings)...	...	...	...	—
Coconuts	...	...	...	230
Coconuts (Pemba)	...	...	...	78
Litchi layers	...	...	...	1,850
Mango (budded)	...	...	...	300
Mango (inarched)	...	...	...	910

Production of Vegetable Seeds

The season for the production of vegetable seeds to meet the now regular demand of local market gardeners was fairly good on the whole. Conditions generally were satisfactory in so far as other factors of production were concerned. Disease incidence was slight and, except for an attack of "Halo Blight" on beans at Pamplemousses, there is nothing unusual in this connection to report. Plantations of peas were almost free from wilt disease which had done severe damage the previous year. Nor were insect pests unusually troublesome.

The following table gives the quantities of seeds produced since 1947:—

Type	1947 Kilos	1948 Kilos	1949 Kilos	1950 Kilos
Beans—TOTAL	306'40	381'20	328'70	366'40
Victory	176'50	220'80	194'60	239'90
Golden Queen	72'10	64'90	46'80	59'50
Long Tom	14'30	23'10	17'60	10'50
Prolific Long-podded	23'80	29'40	10'80	7'00
Canadian wonder	18'70	43'50	58'90	49'50
Bean Broad, "Bocla"	1'00	5'30	0'40	11'23
Butter	—	—	—	—
Winged	—	—	4'30	0'98
Beet root	0'50	0'50	2'50	1'60
Brede Malabar (variegated leaf type) ...	—	—	1'20	10'60
Brede de Chine (Blanc)	7'10	6'01	13'30	20'72
" (Bouquet)	5'80	26'20	—	8'20
" (Salé)	—	—	12'50	—
Brede Malabar Hong Kong	—	—	—	1'00
Brinjal Rosita	1'73	1'74	1'20	0'79
Capsicum—TOTAL	2'10	0'47	1'20	1'11
Chinese giant	0'62	0'36	1'10	0'36
Neapolitan	0'83	0'11	1'10	—
Maul's Red Hot	0'65	—	—	—
Carrot	0'50	2'40	2'50	2'50
Cauliflower	6'50	7'00	2'50	4'42
Coriander (common)	—	—	109'50	97'80
" (Morocco)	—	—	—	43'60
Cowpeas	12'80	16'50	55'40	22'65
Leek	—	1'20	1'20	1'00
Lettuce—TOTAL	5'82	3'82	5'20	4'61
Blonde d'été	1'81	2'10	1'80	0'48
Iceberg	—	0'52	1'60	1'18
Mignonette	2'00	0'49	1'00	0'50
Sucrine	0'34	0'11	0'50	1'58
Webb's wonderful	1'17	0'60	0'30	0'78
Okra (lalo)	—	—	—	3'20
Onion (local)	—	—	1.20	0'42
Peas—TOTAL	119'12	200'10	198'80	433'17
Black-eyed Susan	22'00	36'70	20'40	77'40
Greenfeast	89'30	154'70	132'20	283'80
Local	6'10	8'70	46'20	71'80
Telephone	—	—	—	0'17
Petsai "Distin's type"	1'72	10'62	7'40	11'9
Radish	—	1'83	5'70	1'02
Rave	—	43'50	—	13'60
Salsify	5'00	10'50	10'00	8'11
Solanum nigrum (Brede Martin)	—	0'52	3'00	7'63
Tomato—TOTAL	0'68	1'38	0'60	1'88
Bounty	0'04	—	—	—
Marglobe	0'56	1'38	0'60	1'42
Hawaii	0'06	—	—	—
Pearl Harbour	0'02	—	—	—
Stonor's M.P.	—	—	—	0'46

It will be seen that production of seeds of *Brede Malabar* (Hong Kong)—*Amaranthus gangeticus*—which is a valuable new introduction especially for the poorer classes, of coriander (Morocco type), of okra, of peas (Telephone) and of Tomato (Stonor's M.P.) was undertaken for

the first time. It is proposed to extend plantations next year as soon as it is possible to begin implementation of the plan of development of the Division as provided for under Development and Welfare Funds.

Revenue

There has been no alteration in the prices at which plants and seeds are sold in order not to divert from the policy of making available to the public the best planting material available at the most reasonable cost. The total revenue including the value of material supplied free to Government Institutions, reached the figure of Rs. 13,806 which, although exceeding last year's figure only slightly, constitute nevertheless another record intake, as shown below:—

Stations	1947		1948		1949		1950	
	Plants	Seeds	Plants	Seeds	Plants	Seeds	Plants	Seeds
Barkly	2,780	1,081	3,179	2,470	4,077	3,447	3,638	3,671
Abercrombie ...	3,076	—	3,803	—	4,697	157	4,919	104
Free to Government Institutions	526	—	394	644	270	649	253	1,221
TOTAL	6,382	1,081	7,376	3,114	9,046	4,253	8,810	4,996

Experimental work on crop plants.

Although the Division was very short of staff it was felt that the experimental work should if possible and as far as possible, continue unimpaired. This could only be done at the expense of other work.

The experiments briefly reported upon below were carried out mostly at Pamplémousses and to a lesser extent at Réduit. Barkly is now, of course, chiefly devoted to vegetable seed production and fruit improvement and propagation and there is no available space there for field trials with other crops.

(a) *Coriander*. In 1949, a yield trial of the large-seeded Morocco variety had given over 725 kilos of seed per acre. This year, at Pamplémousses, with more generous manurial treatment which included 6 tons farmyard manure, 180 kilos phosphatic guano and 2 tons wood ashes per acre, the yield of seeds was 520 kilos. The season was not so good, being definitely drier. The plot had to be irrigated three times as compared with no irrigation the previous year. Nevertheless, at the price of Rs. 1.50 per kilo, which prevailed at the time of harvest, this crop can pay within the limits set by local demand and could be grown more extensively in the northern districts of the Island and in parts of Black River.

(b) *Cowpea*. Winter-sown cowpea, variety mottled large, gave a very poor yield—only 86 kilos of air-dried seeds per acre, as against 432 kilos for summer-grown cowpea last year. This failure, apart from season effects, was apparently partly due to some deficiency disease.

(c) *Dholl Kessari*. Following groundnut at Pamplémousses, kessari planted early in May and harvested about 130 days later gave a net yield of only 54 kilos of seed per acre as compared with 159 kilos last year. It appears more and more clearly that Pamplémousses is too hot and too dry for the successful growth of kessari which in fact grows best in the well-watered elevated parts of the Island. It is not intended to continue the experiment at that station.

(d) *Garlic*. Last year, garlic planted 6" × 6" at P.E.S.* gave 2.3 tons (air-dried) per acre. In 1950 a trial to compare two spacings (a) 3" × 3" and (b) 6" × 6", was laid down. The fertilizer treatment consisted of 4 tons farmyard manure 120 kilos phosphatic guano and 1,600 kilos wood ashes. The yields, depleted through deficient rainfall, were (a) 1,562 kilos (b) 1,243 kilos per acre (air-dried).

(e) *Groundnut*. Two trials were laid down at P.E.S. at a spacing of 12 × 15 inches in one of which the earlier varieties of groundnut were grown for comparisons of yields. In the second trial the later varieties were grown for the same purpose. In both cases sowing took place in the first week in December, 1949. There were 3 seeds per hole. The plots received 10 tons farmyard manure, 500 kilos wood ashes and 200 kilos phosphatic guano per acre. Each variety was replicated six times. There was no watering or irrigation. Rainfall: 28 ins.

The results are shown below;—

(i) Early varieties:—

				San Jose	Vigan Lupog	Valencia
Cycle—days	...	...	...	156	156	156
Yield/acre—air-dried and unshelled—kilos				1,063	1,375	830

(ii) Late varieties:—

			Cabri	Butt	Virginia Bunch	Gambia	Spanish	Bunch	Virginie	Tirik
Cycle—days	...	...	170	170	170	170	170	170	170	170
Yield/acre air-dried:—										
(a) Unshelled kilos	...	...	1,011	1,530	1,763	1,504	1,011	1,685	1,296	1,660
(b) Shelled kilos	...	...	739	1,129	1,278	1,122	743	1,203	955	1,208
Shell percentage	...	...	26.9	26.2	27.5	25.4	26.5	28.3	26.3	27.2

(iii) A third trial with groundnuts was carried out at C.E.S.† to compare the respective performance of the old varieties in the collection with a number of recent introductions. The same manurial treatment as above was given with, in addition, 50 kilos muriate of potash and 50 kilos sulphate of ammonia. Spacing: 12 × 15 inches. Seeds per hole: 4. Rainfall 38 inches in 97 days. Crop cycles: 122–142 days, varying with different varieties. Sown 1st. December, 1949, Harvested 1st. April 1950 to 26th April, 1950.

* P.E.S. = Pamplémousses Experimental Station. Altitude 180 feet.

Mean Summer temperature	...	24.8°C	Mean Summer rainfall	...	38.5 inches
Mean Winter	...	21.1°C	Mean Winter	...	12.1 inches
Mean Annual	...	22.9°C	Mean Annual	...	50.6 inches

† C.E.S. = Central Experimental Station, Reduit. Altitude 1043 ft.

Mean summer temperature	23.1°C	Mean summer rainfall	49.2 ins.
Mean winter	19.2°C	Mean winter	14.3 ins.
Mean annual	21.1°C	Mean annual	63.5 ins.

The yield of air-dried unshelled nuts per acre was :—

Kilos				Kilos			
Tennessee	661	Mambala	665				
Local	696	Mwitunde	553				
Cabri	617	Rolande	525				
Bunch	611	Virginia Bunch	595				
Barbeton early	484	Gudiyatan	640				
Grocind	580	L 3 G 44	474				
Manyema	604	Amenduni	463				
Mgongo	584	L 3 G 68	466				

- (iv) Another variety yield trial at C.E.S. planted in January was harvested in May. Close planting methods were adopted as usual, the holes being 12×14 inches apart. The manurial treatment consisted of 5 tons compost only. There were 33 inches of rain in 77 days. The yields obtained were :—

Kilos of air-dried unshelled nuts per acre				Kilos of air-dried unshelled nuts/acre			
Cabri	1,150	Tennessee	1,213				
Bunch	1,073	Barbeton	1,197				
Manyema	1,166	Grocind	1,057				
Mgongo	1,089	Mwitunde	933				
Rolande	995	Local	1,089				

- (v) A lime response trial was also carried out at P.E.S. with the variety *Vigan Lupog*. The limed plots, of which there were four replicates, received 500 kilos slaked lime five weeks before the nuts were sown. The plots also received 10 tons farmyard manure, 500 kilos wood ashes and 200 kilos phosphatic guano per acre. The plots depended upon rainfall only of which 27·5 inches fell during the duration of the experiment. Possibly because of the nature of the manurial treatment, possibly also owing to the fairly high base content of soils in the Pamplémousses area, there was no response to the treatment, the limed plots yielding 1369 kilos per acre, the unlimed plots 1463 kilos.

(f) *Lentils*. A small plot grown for observation and yield was sown at P.E.S. early in May and harvested early in September. Neither manure nor fertilizers were given. The seeds were sown in drills 18 inches apart. Water had to be given in the earlier stages of growth owing to dryness of the season and the irregularity of the rainfall. The mean yield of air-dried pulse per acre was 139·6 kilos. At the time of harvest imported lentils were selling retail at 70 cents per kilo.

(g) *Maize*.—(i) A plantation made at P.E.S. in November 1949 and harvested in March 1950, without fertilizer, but following a crop of French beans, showed definite symptoms of nitrogen deficiency and gave only 560 kilos of air-dried grain per acre.

- (ii) January and February planted maize always give a higher yield. At C.E.S. a crop receiving phosphatic guano and 50 kilos sulphate of ammonia gave 882 kilos per acre.

- (iii) A third sowing at P.E.S. attempted making a simple comparison between a crop raised from soaked seeds and one from unsoaked seeds. Soaking lasted 12 hours at the rate of 50 c. cs. of water for 100 grams seeds or just about enough for complete absorption of the water added. No fertilizers at all were given. Each treatment was replicated ten times. Neither watering, nor irrigation was given. Spacement : 3×3 feet. Rainfall during growth was 24.5 inches. The "soaked" plots outyielded the "unsoaked" by nearly 100 kilos of air-dried grain—1,157 kilos as compared with 1,060 kilos per acre.

(h) *Manioc*. (i) A simple trial, unfortunately limited through lack of space, but interesting enough in view of the treatment given and the yields obtained, was carried out at C.E.S. In that trial, planted in August 1949 and harvested in July 1950, two plots received no fertilizers at all, while two others received in one case 2.70 tons compost per acre, in the other 1.35 tons compost, 675 kilos wood ashes, 160 kilos phosphatic guano and finally 80 kilos sulphate of ammonia two months after planting. Spacement was 4×2 feet., with 2 cuttings per hole. Rainfall: 52 inches.

The plots receiving compost alone and fertilizers and compost showed excessive vegetative growth with a depression in the yields which were as follows ;—

				Compost only	Compost and Fertilizers	Nothing
Tons/acre	...	...	...	5.3	4.6	6.1

(ii) A spacement trial was carried out at P.E.S. from November 1949 to July 1950 following a crop of beans. The following planting distances were compared :—

(a) 6 feet $\times$ $2\frac{1}{2}$ feet (b) $4\frac{1}{2}$ feet $\times$ $2\frac{1}{2}$ feet (c) $3\frac{1}{2}$ feet $\times$ $2\frac{1}{2}$ feet

No manure was applied. Each planting distance was replicated three times. Two cuttings were placed uniformly in each hole in all the plots. Watering was done to start growth only. Rainfall was 34 inches. The yields were as follows :—

(a) 3.04 tons per acre (b) 3.84 tons per acre (c) 4.65 tons per acre

The spacing normally adopted in departmental work is $4\frac{1}{2} \times 2\frac{1}{2}$ feet. The above results indicate that more spacement trials must be carried out and it is hoped to do this as soon as more land becomes available under Development and Welfare Funds.

(iii) The third trial with manioc consisted in a *time of digging/quality* experiment. The first of these trials was carried out the previous year, when it was shown that cooking quality of variety *Manioc de Table* was excellent from June to August. Reaped before the 1st June and after 1st September cooking quality is unsatisfactory. The experiment was repeated on a somewhat larger scale, but with the same variety, cooking quality being determined every month from May to November. Last year's results were almost exactly confirmed. The next step, therefore, will be the testing of all the better, table varieties, not only over twelve months but over at least eighteen or even more. This also is a matter of more land being at our disposal.

(i) *Okra*. Okra or "lalo," as it is known locally, is grown in Mauritius solely as a summer vegetable. Nothing is known of its yield as such. It is also being increasingly studied for the oil content of its seeds. A small trial was laid to determine yield of fresh fruit and of dry seeds of a variety introduced some ten years ago. The holes were 3×2 feet apart. Three seeds were sown in each hole after manuring at the rate of 5.5 tons per acre and giving 1.2 tons wood ashes. The plot had to be watered in November. There were slight attacks of Aphis and red spider which were controlled by spraying. The green vegetable was harvested over a period of two months, the seeds over three months. The former gave a yield of 1.6 tons per acre, the latter of 138 kilos. Further investigations will be carried out with this despised, but valuable, plant in the future.

(j) *Onions*. Last year onions of the small red pungent type common locally were grown experimentally for yield determinations at a spacing of 6×6 inches. In 1950, a trial was laid out to compare yields at spacings of (a) 3×3 inches and (b) 6×6 inches. The crop received fertilisation as follows: farmyard manure 7.6 tons per acre, phosphatic guano 470 kilos, wood ashes 2.8 tons. Although the crop was watered regularly, such watering even with the best supervision available, cannot make up for deficiency of rainfall. It is possible also that under the above circumstances the generous phosphatic application depressed yield. In any case, the yields of "dry" onions obtained were: (a) 2.71 tons and (b) 1.94 tons respectively as compared with 4.45 tons last year for the wider spacing.

(k) *Phaseolus species*. *Phaseolus radiatus* sown in the middle of February gave a much lower yield at P.E.S. than the preceding year when it was sown in January. *Phaseolus Mungo*, although attacked by *Agromyza* gave 293 kilos dried seed per acre, while *Phaseolus aureus* yielded only 151 kilos. Work on these species will be developed when more land and more trained personnel are available.

(l) *Potatoes*.—(i) A trial carried out at P.E.S. compared yields obtained from two varieties, *Malgache* and *Up-to-Date*, and from small seed tubers and large tubers. There was a series of three plots, replicated six times in a random manner. These plots were planted with sets of the following average weights and varieties:

(a) Up-to-Date	...	...	40 grams
(b) Malgache	...	...	35 "
(c) Malgache	...	...	12.5 "

The trial was planted in June and lifted in September. Manurial treatment was liberal and complete. Rainfall was very scanty, only 5 inches falling during the 84 days the trial occupied the ground. Blight disease severely attacked the plants, Up-to-Date suffering considerably more than Malgache. The yields contained were as follows:—

		Up-to-Date		Malgache	
		Big sets		Big sets	Small sets
Yield/acre	Tons	...	2.29	5.46	3.95
Seeds/acre	"	...	0.91	0.71	0.27
Net Yield	"	...	1.38	4.75	3.68
No. of sets	/100 kilos	...	2,500	2,860	8,000

These results are interesting from several points of view. They show, first, the greater resistance of Malgache seeds to blight disease—a fact of great importance to local growers who have been cultivating this variety for years; they point to the practical advantage of using small sets in certain cases under local conditions; finally, these Malgache seeds have been kept in Cold Storage from season to season since 1945 and although the yields were smaller in 1950 than in 1949, this factor alone is not yet enough to suggest that the seed source should have been renewed.

(ii) and (iii) Two more trials were carried out with potatoes, one at C.E.S. and the other at P.E.S. These were planted at the end of July, rather late in the season. They were more complicated experiments than the above and attempted to effect several comparisons; first, between varieties *Up-to-Date* and *134*; second, between farmyard manure with complete fertilizers and compost also with complete fertilizers; third, to determine whether it was advantageous to plant with *engrais Paulia**.

The manurial treatment was as follows: 10 tons farmyard manure or 10 tons compost, with 80 kilos superphosphate, 30 kilos sulphate of potash, and 75 kilos sulphate of ammonia applied in two doses after germination. Half the area under each variety was further given an application before planting of *engrais Paulia*.

Notwithstanding the virtues claimed for *engrais Paulia*, the *Up-to-Date* variety suffered severely from blight and to a lesser extent from leaf curl.

The results obtained are summarised in tabular form below:—

GROSS YIELDS PER ACRE IN METRIC TONS					C. E. S.		P. E. S.	
					134	<i>Up-to-Date</i>	134	<i>Up-to-Date</i>
Manure and fertilizers without <i>Paulia</i>	...	...	...	...	7.09	1.68	5.81	4.11
Manure and fertilizers with <i>Paulia</i>	...	...	...	...	5.84	1.07	4.95	3.39
Compost and Fertilizers without <i>Paulia</i>	...	...	...	...	4.16	1.01	5.56	3.71
Compost and Fertilizers with <i>Paulia</i>	...	...	...	...	5.31	0.97	5.00	3.31
Manure	...	...	...	...	6.47	1.37	5.37	3.75
Compost	...	...	...	...	4.74	0.99	5.28	3.51
<i>Paulia</i>	...	...	...	...	5.58	1.04	4.97	3.35
No <i>Paulia</i>	...	...	...	...	5.63	1.34	5.69	3.91

(m) *Sweet Potato*. Variety *Joese* was utilized in a trial in which tubers were compared with vines as planting material. It is known that in some places tubers are used for planting. Plots were replicated six times and half the area under each type of planting material was given liberal manurial treatment while the other half had nothing. Fertilisation consisted in 2.2 tons of wood ashes per acre, 220 kilos of phosphatic guano and 175 kilos sulphate of ammonia. The yields obtained were:—

		Vines	Tubers
Manured	...	5.69	4.01
Unmanured	...	6.22	2.98

*" *Engrais Paulia* " is a proprietary product of French origin containing in liquid form the various minor elements likely to be deficient in a continuously cropped soil and for which the additional advantage of controlling disease incidence is claimed. For this reason, the above trial was not sprayed against (*Phytophthora*).

These figures are obviously too erratic. The plantation had suffered severely from drought which explains why the manure did not work, while soil heterogeneity contributed to the lack of accuracy.

(ii) *Yams*. Four trials were conducted with *yams*, one at C.E.S. and three at P.E.S.

(i) At C.E.S. a trial containing the varieties shown in the table below was manured with $2\frac{1}{2}$ tons compost per acre and 120 kilos phosphatic guano. Space did not allow the separation of late from early varieties for inclusion in different trials, but the growth cycles are shown :—

		<i>Orien- tal</i>	<i>Danish</i>	<i>Uzia- mani</i>	<i>Cush</i>	<i>Hen- den I</i>	<i>B.N. Lisbon</i>
Cycle—days	... ..	292	292	292	292	292	292
Gross yield/acre—tons	... ..	12.2	11.4	10.9	10.2	8.71	5.85
Rainfall—_inches	... ..	52	52	52	52	52	52
		<i>Light- red</i>	<i>Angi- lala</i>	<i>Bira Bukobe</i>	<i>Han- den I</i>	<i>Cush- cush</i>	<i>Fugue</i>
Cycle—days	... ..	327	327	327	327	379	379
Gross yield/acre—tons	... ..	17.0	12.1	12.1	8.40	3.44	3.05
Rainfall—_inches	... ..	54	54	54	54	54	54

(ii) and (iii) At P.E.S. the crop was lifted after 286 days, three varieties being dug seven days later. The field was given 8 tons farmyard manure and 1 ton wood ashes per acre before planting on ridges 4 feet apart. For purposes of this Report the yields obtained are all shown together :—

<i>Varieties</i>		<i>Mean gross Yields/acre Tons</i>	<i>Weight of "seed" /acre Tons</i>	<i>Net yields per acre Tons</i>
Handeni I	... ..	19.7	2.4	17.3
Light red	... ..	12.4	1.7	10.7
Angilala	... ..	11.6	1.2	10.4
Kahata Kondol	... ..	11.4	1.7	9.7
Handeni IV	... ..	10.7	1.0	9.7
Danish	... ..	10.9	1.8	9.1
B. N. Lisbon	... ..	9.0	1.1	7.9
Fugue	... ..	8.1	0.8	7.3
Sealed top	... ..	8.0	1.2	6.8
Crop	... ..	8.0	1.3	6.7
Horn	... ..	7.8	1.1	6.7
Oriental	... ..	7.8	1.2	6.6
Cush	... ..	7.0	1.3	5.7
Lisbon	... ..	6.0	0.8	5.2
Cush-Cush	... ..	5.5	0.5	5.0

(iv) The fourth trial with *yams* was to compare the yields obtained when the date of planting varied from normal practice (October/November). Planting in October/November in the lower regions means planting in dry weather and it seemed as if nothing was to be gained by early planting. *Light red* was chosen for the trial. Each plot was replicated four times. Manure and ashes were applied as

above, ridges were 4 feet apart and treatment was the same in all respects. The results are shown below; they clearly indicate that there is no point in planting before the summer rains really set in, while late planting results in great reduction of crop:—

Planting Times			20.10.49	17.1.50	17.2.50	17.3.50	17.4.50
Date germinated...	...	...	9.11.49	3.2.50	2.3.50	3.4.50	6.5.50
Date lifted	...	...	2. 8.50	9.8.50	9.8.50	9.8.50	9.8.50
Cycle—days	...	...	286	204	173	145	114
Rainfall—inches	...	...	35.5	27.5	24.7	19.0	10.9
Gross yield/acre—Tons	...	...	12.4	13.1	3.7	3.6	0.3
Wt. "Seeds"/acre—Tons	...	...	1.7	1.6	1.8	1.4	1.4
Net yield/acre—Tons	...	...	10.7	11.5	1.8	2.2	-1.1
As %	...	...	100	108	18	20.5	~ 9

Experiments with *Furcraea*

(i) During the year funds became available under Development and Welfare and a part of Crown Land Richelieu adjoining the Tobacco Experiment Station was cleared and laid down with *Furcraea* in a series of simple field trials. At the same time a small plot was planted with a small collection of other fibre plants growing in the Island.

Five trials and observation plots were laid down. These include three spacement experiments, one "variety" trial (containing bulbils from different parts of the Island) and a plot interplanted with acacia *Leucaena glauca* which is found growing in natural association with *Furcraea* in the fibre zone and may exercise a favourable influence on the fibre plant. The scope of these experiments will be extended next year when more land will be cleared.

(ii) It is obvious that results from these trials cannot be expected for several years. It will, therefore, be of interest to fibre producers to have in some detail the results obtained from a small trial—the first of its kind—laid down at Chaumière to compare yields and other factors, such as incidence of poling, of *furcraea* and sisal.

The trial was planted close to Chaumière Aloe Factory in November 1945 from bulbils aged about 8 months collected in the vicinity. There were four randomised blocks. The plants were laid down in accordance with local practice, i.e., at a planting distance of 5 feet × 5 feet. There were 48 plants in each plot. The only attention the field received was an occasional weeding and some de-suckering of sisal.

In 1947, when the time to effect the first cut came, it was decided to widen the scope of the trial by sub-dividing the plots into three and to cut leaves from these at intervals of 6, 12 and 18 months. In May, 1948, the 6 months plots were cut for the first time. Cutting then proceeded every six months until November 1950 when the first sub-plots had been cut 6 times, the second 3 times and the third twice. The trial is still under way, but it was felt that the results so far obtained were of sufficient interest to be worked out and presented in a simple form. This has been done in the following table which needs but little further comment at this stage as the final results will form the subject of a separate publication,

COMPARATIVE YIELDS OF FURCRAEA AND SISAL CUT AT INTERVALS OF 6, 12 AND 18 MONTHS

Interval between cuttings		1		2		3		4		5	
		Number of plants cut		No. of leaves cut (total)		Average number of leaves cut per plant		Calculated number of leaves cut per acre		Mean weight of each leaf cut (gms)	
		Furcraea	Sisal	Furcraea	Sisal	Furcraea	Sisal	Furcraea	Sisal	Furcraea	Sisal
Plants 6 to 8 months old. No. of replicates : 4		Planted : 5.11.1945 Locality : Chaumiere. Planting distance : 5 x 5 feet. Altitude : 600 feet.									
6 months	...	16	16	259	266	16.2	16.7	28,250	29,175	586.5	354
"	...	16	16	171	234	10.7	14.6	18,650	25,450	536.5	539
"	...	16	16	391	387	24.4	24.2	42,635	42,250	513.5	446
"	...	16	16	248	314	15.5	19.6	26,930	34,225	567.5	528
"	...	15	16	291	371	18.2	23.2	31,725	40,450	517.0	571
"	...	15	16	260	372	17.5	23.4	28,475	40,625	502.0	666
8 Cuts		—	—	1 620	1,946	102.5	121.7	176,675	212,150	586.2	517.3
12 months	...	16	16	446	522	28.0	32.6	48,825	56,900	606	383
"	...	16	16	598	675	37.2	42.1	64,975	73,525	853	503
"	...	15	16	524	813	34.3	50.8	57,175	83,625	777	729
3 Cuts		—	—	1,568	2,010	99.5	125.5	170,975	219,650	678.7	538.3
18 months	...	16	16	803	969	50.2	60.5	87,525	105,625	674.5	478
"	...	11	16	459	1,150	52.2	71.8	50,025	125,325	1089.0	712
2 Cuts		—	—	1,262	2,119	102.4	132.3	137,550	230,950	881.8	595.0

COMPARATIVE YIELD OF FURCRAEA AND SISAL CUT AT INTERVALS OF 6, 12 AND 18 MONTHS—continued

Decorated in "grasses".														
No. of plants per acre : 1742.		Average annual rainfall : 40 inches.		6		7		8		9		10		
Interval between cuttings	Date of cutting	Weight of leaves cut per subplot Kg.		Calculated weight of leaves cut per acre Tons		Calculated weight of dry fibre obtained per acre Kg.		Calculated weight of fibre per hect Gms.		Dry fibre % green leaf				
		Furcraca	Sisal	Furcraca	Sisal	Furcraca	Sisal	Furcraca	Sisal	Furcraca	Sisal			
6 months	...	19	5 1948	...	130.4	94.8	16.4	10.3	375	318	13.3	10.9	2.89	3.08
"	...	...	18 11 1948	...	140.0	125.8	15.6	13.7	417	471	22.4	18.5	2.87	3.43
"	...	...	18 5 1949	...	200.0	172.0	21.0	18.8	651	745	15.3	17.6	2.08	3.06
"	...	...	17 11 1949	...	140.7	165.8	15.3	18.1	469.5	817.5	17.4	23.9	3.00	4.52
"	...	...	27 4 1950	...	150.1	212.1	16.8	23.1	583	975	18.4	24.1	3.56	4.22
"	...	...	6 11 1950	...	151.2	248.3	14.3	27.1	585	1357.5	20.6	33.4	4.10	5.01
8 Cuts					915.9	1019.7	99.9	111.1	3080.5	4684.0	—	—	3.08	4.21
12 months	...	...	18 11 1948	...	271.4	200.1	29.58	21.8	696	707	14.0	12.4	2.31	3.24
"	...	...	17 11 1949	...	1557.6	339.4	42.44	37.0	1284	1686	19.7	22.7	3.02	4.51
"	...	...	6 11 1950	...	407.6	592.9	44.42	64.6	1563.5	2368.5	27.4	32.4	3.52	4.43
3 Cuts					2236.6	1132.4	116.44	123.4	3533.5	5241.5	—	—	3.03	4.24
18 months	...	...	18 5 1949	...	542.0	463.3	59.05	50.50	2127	2164	24.3	20.5	3.60	4.28
"	...	...	6 11 1950	...	500.0	822.6	54.50	80.21	2166.5	4074.5	43.3	32.5	3.98	4.56
2 Cuts					1042.0	1285.9	113.55	139.71	4293.5	6238.5	—	—	3.78	4.46

The most interesting part of these results are given in columns 3, 4, 7, 8, 9 and 10. The number of leaves cut per plant is practically the same in all three cases, but the total number of leaves cut per acre is markedly smaller in the 18-months plots of *Furcraea*. This was due to the greater incidence of *poling* in these plots. For the same reason, the total weight of leaves cut per acre is greater in the 12 months *Furcraea* as compared with 6 and 18-months. The quantity of dry fibre obtained per acre, however, is greater in the 18-months plots owing to the greater maturity of the leaves as shown in columns 9 and 10 and because account was taken of the weight of the "pole cut". It will be necessary to wait for the end of the experiment to obtain a clearer idea of the final yield of fibre per acre from the different plots.

(iii) Next in the order of interest is the incidence of *poling* in the three categories of plots mentioned above. The various counts made are summarised below as at 21st November, 1950 :—

		<i>Furcraea</i> Cut every			<i>Sisal</i> Cut every		
		6 months	12 months	18 months	6 months	12 months	18 months
TOTAL No. of plants poled	...	0	0	5	4	24	31
As per cent	...	0	0	7.8	6.2	35.0	48.4

(iv) *Loss of weight through evaporation of cut Aloe leaves at Richelieu.*—Nowadays, aloe leaves are collected all over the Island for decortication. These are often sold "per load" of cart or lorry. Decortication does not always take place on the same day the leaves are cut. It was, therefore, considered worth while to determine the loss of weight of cut leaves due to evaporation after 1, 2, 3, 4 and 5 days. Only one such determination could be made—at Richelieu. The following table shows the loss of moisture expressed as percentages of the fresh weight :—

		<i>Bundles of leaves</i>			
		<i>Scattered and fully exposed to sun</i>	<i>Stacked in the sun</i>	<i>Scattered under tree shade</i>	<i>Stacked under tree shade</i>
		1	2	3	4
After 24 hours	...	2.0	2.2	2.0	0.8
After 48 hours	...	3.6	3.0	2.2	1.6
After 72 hours	...	7.5	5.6	3.5	3.5
After 96 hours	...	10.2	9.0	6.0	6.0
After 120 hours	...	14.0	11.8	8.4	8.2

On the third day 2.1 mm. of rain fell.

(v) *Average length of cut cultivated Furcraea leaves.*—In view of the construction of the new Robey *Furcraea* Decorticator the pilot model of which is designed to deal with leaves not exceeding 5 feet in length, it was considered desirable to carry out a number of measurements

of *Furcraea* leaves cut at intervals of 6, 12 and 18 months in the Chaumière experiment. Thirty leaves from each plot were measured after removal of the minute tip thorn. The mean lengths ascertained are shown below :—

		Leaves cut every		
		6 months	12 months	18 months
Average length	...	3 feet 10 inches	4 feet 3 inches	4 feet 7 inches
Shortest...	...	3 " 3½ "	3 " 3 "	3 " 10 "
Longest...	...	4 " 5 "	5 " 9 "	5 " 11 "

Packing of Litchis for Export

According to regulations made under the Fruit Export Ordinance of 1940, the method of packing litchis for export is as follows : "*in flat wooden boxes, 16½ inches long 12 inches wide and 4 inches high separated longitudinally by a wooden partition. The whole interior of the boxes shall be lined with corrugated paper and the fruits shall be packed tight with wood-wool*".

These regulations, however, were framed for transport by ship under cold storage conditions. Nowadays, with rapidly developing air transport, the existing regulations require modification. Some preliminary experiments were carried out to determine the best method of packing for air shipments. Space will not permit of details being given in this Report. Suffice it to mention that three series of experiments were undertaken in succession, the methods proving best in each series being taken up for further investigation. This method of trial and elimination appeared to indicate that sawdust with 25 per cent added moisture was the best packing.

These experiments will be repeated and extended in 1951 before recommendations are made for drafting new regulations.

Allotments

The Allotments Relief Scheme has again been totally administered by the Division. It is, however, hoped that the time is near when the Division will only be responsible for advisory work, thus releasing our very few trained officers for purely agricultural work.

A determined effort was made during the year to get the Allottees to take more active interest in preserving their soil against erosion.

At Richelieu, the distribution of irrigation water was modified in order to make water available on all plots every other day, a measure of real importance in this dry locality.

During the year the Allotment Committee met 12 times to interview new applicants and for general administrative purposes. Ninety four persons were interviewed. Six allottees were evicted for serious neglect of their land ; one resigned. These vacancies were immediately filled from names on the waiting list.

In the light of the experience gained and for the benefit of those who may be responsible in the future for the running of this relief scheme, the administrative rules were improved, added to and re-drafted.

Extension Work

Exactly the same remarks as last year apply and reference is invited to Section 10 of the 1949 Annual Report.

Rodrigues

The Annual Report of the Agricultural Officer stationed in the Dependency is published elsewhere. Climatic conditions at Rodrigues were generally satisfactory.

The following may be specially referred to here :—

- (a) The main effort has gone to soil and water conservation work, chiefly in the Baie Malgache region. The total area protected during the year amounted to 162 acres.
- (b) An experimental maize storage scheme, whereby after harvest the Rodriguan peasant sells his surplus air-dried grain to Government for storage, on the understanding that when his food supply is exhausted he can buy it back, was initiated. This is intended to guard the peasant from getting into the clutches of money lenders. Success was very encouraging, and it is hoped that it will be possible to extend the scheme in the near future.

Pressure of work in Mauritius and acute shortage of staff which, at the time of writing, continues, has made it impossible for the writer, or other senior officer of the Division, to visit the Dependency during the year.

Other Activities

(a) Courses of lectures in agricultural subjects were delivered to students of the College of Agriculture.

(b) The three food settlements at St. Martin, St. Thomas and La Ferme were inspected from time to time and advice given to the planters on various agricultural matters.

Publications

Several articles were published in the *Agricultural Review*.

During the year, the writer prepared a booklet, entitled "The Fibre Industry of Mauritius" for publication early in 1951. This constitutes the first comprehensive survey of the Mauritius hemp industry from the introduction, in 1749, of *Furcraca gigantea* Vent. in Mauritius to the description of the latest machine (1950) in the range of decor-ticators for *Furcraca*.

Acknowledgement

In concluding this review of the work accomplished during 1950 with a much reduced staff, I wish to lay on record my appreciation of the help and loyal support I have received from all my assistants. I am also grateful to the Clerical Staff of the Department for assistance during the six months I was engaged upon departmental administrative work as Acting Deputy Director of Agriculture.

A. NORTH COOMBES,
Deputy Director of Agriculture.

Agricultural Division—Rodrigues

Climatic Conditions

The monthly rainfall recorded at Oyster Bay Experimental Station was as follows :—

				<i>Total mms.</i>	<i>No. of rainy days</i>	<i>Highest rainfall recorded in one day</i>
January	...	...	...	94.1	16	14.2
February	...	...	...	236.4	22	119.9
March	...	...	...	126.7	19	40.4
April	...	...	...	285.3	16	170.2
May	...	...	...	150.9	16	51.7
June	...	...	...	50.9	14	9.0
July	...	...	...	93.2	17	23.3
August	...	...	...	77.8	11	14.7
September	...	...	...	19.5	8	5.1
October	...	...	...	9.7	5	3.6
November	...	...	...	47.8	12	10.7
December	...	...	...	115.7	18	51.7
				1,308.0	174	

General Conditions

The dry spell experienced in 1949 lasted till the middle of January. The farmers had to wait for sufficient rain for the maize plantation and it was only towards the end of January that these could be extended throughout the Island.

Conditions were, in general, very favourable for agriculture ; the winter was mild and for many years the Rodriguans had not seen such a good maize crop. Winter plantations yielded almost as much as the main crop.

Beans have not been plentiful this year owing to too much rain and wind during the growing season.

Ground nut did well, mostly in the La Ferme area.

Onions have been severely attacked by *Thrips*. Cutworms have also damaged the seedlings.

Cassava plantations have been extended mostly up country in poorer soils.

On the 26th February and 21st April floods caused some damage to plantations. In April the main bridge at the Experimental Station was washed away.

The overgrazed cattle walk had a chance to recover slightly owing to more regular and abundant rain, animals are in a better condition than they were last year.

There has been a slight increase in the production of pigs but unfortunately they could not all be exported owing to the lack of shipping space although communications with Mauritius have been more numerous this year.

Fowls were plentiful towards the end of the year.

Provision for two Agricultural Instructors was included in the budget for Rodrigues but they have not been appointed yet. The existing staff consists of one Agricultural Officer and one Overseer.

It was impossible to lay out demonstration plots this year owing to lack of personnel.

A cyclone passed some distance north of Rodrigues on December 4th bringing rain.

Experimental Station

Yield trials have been made with collection of Maize, Beans, Sweet Potatoes, Cassava, Yams, Groundnut and Tomatoes. Also with various other crop such as Cow pea, Phaseolus, Ginger, Safran, Corn flour, Arrow root, Bambara groundnut, Coriander, Peas etc.

Four hundred and ten roots of Bread fruit plants have been received from Mauritius, these together with 277 obtained locally are doing well in the Solar Propagator.

The following plants have been distributed to farmers during the year : 109 Citrus, 25 Bread fruit, 21 Coconut, also plants of Jack Fruit, Guava, Avocado pear, Paw-paw, Custard apple, Mango etc. There has been a great demand for ornamental plants and flowering trees.

All available seeds, chiefly those of fruit trees are being planted for distribution. New varieties of Guava roots have been received from Mauritius.

A new bridge was built at the Experimental Station to replace the one washed away on the 21st April. The span of the bridge has been doubled and is now 18 feet supported in the middle by a concrete pillar. The main culverts at the Station were also converted into permanent structures. A shed has been erected and is used by the labourers for shelter and also as a lunch room.

Stock Farm

A stable to accommodate two cobs has been built by the Public Works Department near the Stock Farm, the work was completed in June. The roof of the stable for sheltering cattle during cyclones has been replaced as most of the timber was perished.

A cross breed Friesland bull was purchased locally for use in the Stock Farm to improve the local stock in the Oyster Bay region.

The old cross breed Africander cow died, she was in a poor condition in spite of extra rations given her.

The Large Black boar which was too old to be of any value also died of an abscess of the liver. It is important to introduce new blood in Rodrigues and it is hoped that this will be possible in 1951.

Pasture reserved for the Station's use are now being surveyed with a view to establish rotational grazing. Before dividing the area into paddocks the question of water supply for the animals will have to be studied.

The number of animals at the Stock Farm is given below :—

CATTLE

Cross breed Friesland.

Birth one heifer. Death one heifer.

Present number : one bull, two cows, one bull calf.

Cross breed Africander.

Death one cow.

Present number : Nil.

PIGS

Large black.

Death one boar.

Present number : Nil.

DONKEYS

Catalonian.

Birth two jack foals.

Present number : three jacks, ten jennies, two jack foals. †

POULTRY

Rhode Island Red.

Sold 7 cocks, 1 hen and 1,380 eggs for Rs. 181.25 cs.

161 placed under broody hens have produced 59 chicks of which 24 died. Present Number: 6 cocks, 13 hens and 35 chicks.

American Bronze Breed Turkeys; sold 17 cocks, 4 hens and 66 eggs for Rs. 191.25 cs; 252 eggs placed under broody birds produced 81 chicks of which 60 died. Present number: 6 cocks, 12 hens and 21 chicks.

Soil Conservation

His Excellency, during his visit in July, was very interested with the progress made for soil conservation in Rodrigues and the vote has been increased to Rs. 60,000 to be spent on the Development and Welfare Estimates. Protective measures have been concentrated at Baie Malgache in newly opened lands.

To keep the soil on the slopes, stone walls 2 to 2½ feet high are built round the contours at 10 feet vertical intervals; these will take some years to fill up, once filled more retaining walls will have to be built uphill at suitable intervals to form proper terraces.

Details of the work carried out from November 1949 to December 1950 are given below:—

						<i>Acres</i>
Area contoured at	Pointe Monnier	...	...	...	...	9
do.	Crève Cœur	...	...	...	...	9
do.	Mt. Tonnerre and Oyster Bay	...	...	...	...	14
do.	Baie Malgache	..	...	...	...	130
TOTAL						162
Cost						52,000 Rupees
Average cost per acre						321 "
Total length of walls erected						173,315 feet
Average cost per foot of wall						30 cents
Average length of walls per acre						1,070 feet

Contours have been built on slopes varying between 10 and 35 per cent. These walls stood up well in spite of the floods we had in summer and look very promising.

The Rodriguans are very interested in the modern system now employed for soil conservation and demands from farmers throughout the island are reaching us asking for their lands to be contoured.

Maize Bins

Most Rodriguans have no means of storing their maize; those who are fortunate enough to possess one or two empty drums fill them up and sell the surplus maize to local traders. Later during the year, they buy the same maize at double the price.

In order to help them, a scheme was tried this year. An advance of Rs. 10 per 100 lb. of maize, brought to be stored by Government, was made to the farmers who, at any time during the dry season will be able to have back 90 per cent of the maize (or part of the maize) stored for them by refunding Rs. 10 for 90 lb. given back. Ten per cent is being deducted for loss in weight of the maize and sweepings.

Two centres have been opened this year, one at Port Mathurin and the other at Oyster Bay. Owing to the limited number of drums available for storage, only 500 lb. of maize per head of family could be accepted to start with. A total of 19,628 lb. has been stored for 50 farmers.

A leaflet on Grain Bins used in Rhodesia has been received and a small one of a capacity of 3 tons, of the same pattern, made of stone masonry was built at the station for experimental purposes.

Land Tenure

The demand for agricultural lands is ever increasing. This year the following have been leased:—

Agricultural lands	...	180.94 acres to 181 persons
Residential sites	...	91
Cattle posts	...	17
Fishing posts	...	2
Shop sites	...	1

Every possible effort has been made this year to try and recover arrears due since many years on rent of lands. Through lack of staff and the well established reluctance of the Rodriguans to pay their rent, the result obtained is far from being satisfactory. One solution would be to appoint an officer who should deal with the question of renewing all expired leases fully paid and subsequently bring before court all lessees who are indebted to Government.

School Gardens

The Latanier School Garden has been partly contoured with stone walls and water was laid on at La Ferme School Garden.

The Overseer has visited the gardens during most of the classes in both schools.

Six of the brightest boys will be chosen every year to follow a two-year course at the Experimental Station, some of these Agricultural Apprentices might become suitable candidates for jobs in the agricultural and forestry branches of the Department. Five apprentices have finished their course this year and after holding an examination three will be taken on next year at the Station, the other two will be employed, if and when possible, on other jobs.

P. REGNARD,

Agricultural Officer, Rodriguans.

Veterinary Division

A. Disease Control

Tuberculosis. A large number of bovines, including animals of the milk breed, were tuberculin tested during the year under review.

On herd animals, the incidence of tuberculosis was found to be very high. It is, however, interesting to note that on a herd of 40 head exclusively composed of last year non-reactors of a heavily infected herd (80 per cent which had been segregated from the reactors and reared on a non-infected pasture, only one positive reaction was recorded on this year's test.

We are convinced that such excellent results will stand as an inducement to breeders for building up healthy herds from highly infected ones. There is no doubt that this policy, if advocated in all breeding centres, will prove in the course of time to be the answer to the problem of eradication of tuberculosis on herd animals of this Colony.

Contagious Abortion. Eight cases were recorded at the Government Dairy.

Segregation of infected cows together with vaccination of heifers with the S. 19 were resorted to.

Mastitis. Some 12 cases of this udder infection were treated. The intra-mammary injection of penicillin in combination with diphenazone gave still better results than the former injection of penicillin alone.

Deficiency Diseases. Many calls were received from cow owners relative to paralysis of milk cows resulting from mineral deficiency.

A high percentage of recovery was obtained as a result of calcium injection or Vitamin D injection or a combination of both.

Internal Parasites. Sheep and goats were treated for internal parasites, especially the stomach wire worm, with excellent results.

Some heavily infected flocks have been completely freed as a result of monthly repeated treatments.

External Parasites. Ticks and sheep nostril flies, the two main external parasites of our local stock were dealt with as usual.

Experiments on dips containing gammexane are going on and the results obtained so far are very promising.

Poultry Disease. Vaccination against fowl pox was applied with practically 100 per cent effectiveness.

Outbreaks of Cholera and infectious coryza were recorded during the year. The latest hyperimmune serum against fowl cholera is reported to be very effective as curative. A large amount of doses has been ordered, and when received will certainly prove to be a useful means of combating this dreadful disease.

B. Sterility Control

Examination of Cows and Heifers. Many cows and heifers belonging to Estate dairies and the "one cow man" were examined for sterility. In most cases the cows were not coming on heat at all, in other cases they were returning to the bull very frequently without conception.

On examination, practically all of them were found to be affected with ovarian cysts. Enucleation of these cysts restored the normal sexual cycle of these animals, and all of them have since become pregnant either through artificial insemination or natural service.

Examination of the semen of the bulls The semen of the bulls used for artificial insemination were regularly examined for concentration and quality of spermatozoa. Bulls producing semen of a poor standard were given a rest and treated with Vitamin C injections. Response was immediate and of long standing.

Ovulation. During the year, all cows of the Government Dairy have been served twice, morning and evening. This practice has considerably improved the percentage of conception.

According to the last assessment for pregnancy 30 cows and heifers are actually pregnant at the Dairy. Experiments are still going on in this interesting field with a view to fixing the time of ovulation and thus find the proper mating time. It is hoped that more and very interesting data will soon be available.

C. Artificial Insemination

Some 200 cows belonging to Estate Dairies and the "one cow man" were artificially inseminated during the year. The percentage of conception reached the highly satisfactory figure of 75 per cent.

The response of the one-cow man to the artificial insemination scheme is increasing as evidenced by the number of calls received from them during the last three months.

With the help of the Propaganda Agents who are going to be appointed it may be assumed that artificial insemination will soon become a national scheme to the great advantage of all breeders.

D. Slaughter Houses and Meat Inspection

Two hundred and twenty-five visits were made to the different abattoirs of the Island during the year.

As usual, all female bovines of the milk breed, were allowed to be slaughtered only after having been found, on examination, unfit for reproduction or suffering from unrecoverable injuries.

The very modern and up-to-date abattoir situated at Pascal has replaced the three old and obsolete ones of St. Julien, Flacq and Pamplémousses, which have been closed.

E. Quarantine

Réduit Quarantine Kennels. Eight dogs and five bitches of different breeds were imported during the year, and placed under observation for a period of six months according to regulations in force.

Réduit Quarantine Station. Six Ongole heifers and one Ongole bull arrived from India in November. They are kept in quarantine at Réduit in a fly-proof byre. Repeated blood examinations for trypanosomiasis have been negative,

They will soon be released and sent to Palmar Breeding Station.

Fort William Quarantine Station. A consignment of cattle from Madagascar (Vohémar) which was not accompanied by a clean bill of health was landed at this Station and kept under close observation. The cattle were sent direct to the Port Louis slaughter house by lorries, and the slaughtering was supervised by a Veterinary Officer of this Department.

F. Veterinary Education

Lectures on Veterinary Pathology and Bacteriology, Physiology of Farm Animals and Animal Husbandry were delivered to students of the College of Agriculture.

G. General

Every possible assistance was given to breeders in general during the year. All calls received were promptly attended to.

There was such a great increase in demand for assistance that the staff was under considerable pressure of work during the whole year.

H. Inspection Abroad

Dr. Lionnet, former Government Veterinary Surgeon, now retired, and Mr. Tristan Rivalland an Officer of the Veterinary Division, proceeded on a special mission to Madagascar from the 16th of November to the 8th of December last. They visited Tananarive, Majunga, Diego Suarez, Vohémar, Tamatave and many other breeding centres. The main object of this mission was to investigate the position as regards the prevalence of animal diseases in Madagascar generally and in Vohémar particularly.

The report of their findings has been submitted to Government for consideration,

A. DARNÉ,
Senior Veterinary Officer.

Animal Husbandry Division

General

While waiting for funds to extend his work, the animal Husbandry Officer continued with research along the lines laid down in his 1949 report, viz:—

- (a) *Adaptability of the Friesland and its Crosses to Climatic Conditions in Mauritius.* Pure-bred Frieslands as well as their half and three-quarter-bred crosses with the "Creole" milk cow appear to be well suited to the climatic conditions at the Government Dairy, Curepipe. Preliminary heat tolerance tests at Palmar, however, indicate that the Friesland cannot stand up to the summer heat there. Comprehensive tests are to be started soon and a report will be submitted in due course.
- (b) *Crossing of the Friesland with the Creole to increase Milk Production of the latter.* This is to a large extent bound up with (a) above, in that environment will play a more important part than breeding. In the Dairy herd, half-breds show an average increase in production over their Creole dams of about 30 per cent which is maintained by the few of their three-quarter-bred progeny which have calved. More reliable figures will be available towards the end of the year.
- (c) *Contagious Abortion.* Facts and figures are still being methodically collected, and the Animal Husbandry Officer hopes before he leaves to present them in a form suitable for interpretation by trained pathologists. Four hundred agglutination tests have been made, covering 94 animals in all stages of pregnancy and otherwise. Besides the ordinary routine tests, all pregnant animals are now being tested every month.
- (d) *Fertility in Stabled Cows.* Research in this important subject has continued, and it has been established that ovarian cysts are the main cause of infertility in the Dairy herd, and probably on the Island as a whole. Research among Indian-owned cows will be undertaken when staff is available.
- (e) *Origin of the Creole Milk Breed.* It has been established beyond reasonable doubt that this breed is of entirely European origin; most probably a mixture of the old Scandinavian polled mountain stock and the Norman and / or Breton breeds.
- (f) *Hay Making.* Now that funds are available a start is to be made immediately with pilot hay-making schemes, although it will be some time before the necessary machinery from England can be landed.

Bulls at Outstations

There were on an average 11 bulls for use by small breeders; 738 cows were served, of which 191 or 26 per cent returned to the bull. The services are 140 lower than last year, while re-services are 60 higher. This is due mainly to the heaviness and sluggishness of the ageing

imported bulls. There are only two of the 1944 importation left, and it will not be long before they join their compatriots. Six were disposed of for slaughter during the year on account of impotence. Pending pure and three-quarter-bred animals being available—there are quite a number coming on—half-bred Friesland/Creole young bulls are being used as a stop gap, and are well patronised by the peasant breeders.

Sale of Young Breeding Stock. A scheme for the disposal of surplus young breeding stock from the Government Dairy is under review by the Parquet ; has been in fact since last May.

Palmar Stock Breeding Centre. The station is being developed and will soon be an asset to the Island.

- (a) The *Afrikander* and *local Zebu* herds established there many years ago are to be retained but reduced in numbers.
- (b) In November last six *Ongole* females and a bull were imported from Madras. With the exception of one or two they are disappointing. India has certainly not given, or rather sold, of her best, and that for a goodly sum. Two cows have calved at Réduit Stock Farm and both calves are palpably cross-breds. They all go down to Palmar in a few days to start a stud for supplying new blood to herd owners.
- (c) A small stud of eight pure-bred *Black Head Persian* ewes has been taken over from Flat Island, and two rams have been imported from South Africa. Twenty five cross-bred Persians were also taken over from the Land Settlement Officer. Pure-bred and near-pure bred animals will be available for sale to breeders in a year or two.
- (d) A breed of sheep which should prove of more value than the Persians is being tried out. This is the *Dorsian or Dorper*, ten ewes and two rams of which have been imported from South Africa. This breed, though bred for hard conditions, is early-maturing and fecund and yields a good carcase of high-quality, well marbled mutton. Like the Persians these animals have come through the recent dry spell without supplementary feed and without loss of condition.
- (e) Six *Anglo-Nubian* does and two buck kids have been received from England and it is hoped that they will be the foundation of milk goat breeding in Mauritius. As an experiment it is proposed to cross the bucks with suitable roomy local does, but the main object of the importation is to start a stud of pure-breds.
- (f) *Young Heifers* from the Dairy herd are being stationed at Palmar to grow out under natural conditions. The results are so far pleasing. They will also be used in the forthcoming heat tolerance tests.

Government Dairy

Milk Production. The following table shows that although individual production has risen by 20 per cent, total production has increased only by 5.6 per cent. This is because there were fewer cows in milk due to lowered fertility :—

	1949	1950	Increase or Decrease
Total milk produced (litres)	92,498	97,700	+5,202
Average No. of cows in milk	34	29	- 5
Average production per cow for year ...	2,720	3,370	+ 650
Average daily production per cow ...	7.5	9.0	+ 1.5

Fertility. The calving rate fell from 60 per cent to 54 per cent—very low, but now that the main cause is known (ovarian cysts) steps have been taken to remedy this sorry state of affairs. Assessments for pregnancy show that there will be heavy calvings in 1951.

That cysts cannot be blamed entirely for low fertility is shown by the fact that there is a definite correlation between the fertility of the herd and the incidence of contagious abortion, particularly at the time of service. Whether or not there is any inter-connection between abortion and cysts, I cannot say, but don't think it likely, as cysts are very prevalent among Indian-owned cows where there is very little, if any, abortion. Anyhow, it would be an interesting line of research.

Lack of exercise is most likely the greatest factor in the formation of ovarian cysts. Dairy heifers running free at Palmar are coming into heat before their second year and conceive readily when put to the bull later.

Contagious abortion. The disease is still rife in the herd. 23.5 per cent of the total calving during 1950 were abortions, an increase over last year of 5.5 per cent. No definite reason can be ascribed at this stage, although various lines are being followed up.

All heifers are being vaccinated with S. 19 anti-abortion vaccine at about four months. Five done two years ago have calved at full term, although one showed a consistently high titre ranging from 1/250 to 1/500 for nearly a year before calving, but nothing can be adduced from a single case.

It is hoped that the use of S. 19 will greatly reduce the number of abortions. Slaughtering of reactors will have to be considered when the herd is up to full strength.

Réduit Stock Farm. During the year six in-calf Creole cows were bought from Indian peasant owners and installed in an Indian type shed erected for them at the Farm. They are receiving as near as possible the same treatment as they would were they still peasant owned. All but one have calved, and their milk is being recorded as a guide to what may be expected from Indian-owned cows. Next lactation they will be moved to an airy shed and put on to balanced rations and the difference in production noted.

It is proposed to increase the Creole herd and improve it by selection, as there is a lot of good in the breed.

J. G. S. BENNIE, [†]
Animal Husbandry Officer.

Tea Division

Staff

The staff was composed of the Tea Officer, Mr. F. O. Sprinks and the Assistant, Mr. J. Brouard. A Lady Typist, Mrs. O. Louise, was appointed in August. The Tea Officer, Mr. Sprinks, left the Colony, on leave, early in October.

Weather. The weather, on the whole, has been favourable for the growth of tea, except in September when it was very cold and windy. The last quarter (October-December) was particularly favourable and the production for that period showed an increase of 24 per cent over same period last year.

The rain gauge was transferred from Parc aux Cerfs to Crown Land Wooton in April, so that a complete rainfall record cannot be given here. The rainfall at Bois Chéri Factory is given instead :—

Months	1949		1950	
	Rainfall in inches	Rainy days	Rainfall in inches	Rainy days
January ...	10'53	25	14'91	29
February ...	23'61	24	9'18	25
March ...	13'99	26	39'30	30
April ...	11'90	29	21'11	29
May ...	8'13	28	5'25	15
June ...	14'91	27	18'36	21
July ...	9'14	25	11'38	25
August ...	5'47	27	12'88	23
September ...	3'29	18	8'10	20
October ...	3'15	21	5'02	18
November ...	8'37	20	7'88	14
December ...	5'90	23	16'21	24
TOTAL ...	118'39	293	169'58	273

Production

Imports and Exports. The total production of tea (Black Tea and Green Tea) for the year has been 753,000 English lb. which represents an increase of 91,000 lb. over last year, i.e., 14 per cent approximately. This increase is entirely due to better treatment of areas planted before 1948 and also to the tea bushes becoming more mature. The area planted in 1948 and 1949 has not yet come into bearing :—

	Permits issued for tea planting (Arpents)		Area planted in arpents	
	Rs.	c.	Rs.	c.
Before 1948 ...	1,926	90	1,926	90
In 1948-49 ...	322	00	62	42
In 1950... ..	657	53	75	58*
	2,906 43		2,064 99	

It is estimated that in 1950, about 1,800 arpents were in full bearing as compared to 1,600 arpents in 1948. The average yield per arpent for the whole island in 1950 was 754,000/1,800 or 420 English lb. per arpent approximately.

* This figure does not include the tea planted by Government at Crow Land Wooton.

Mauritius should aim at average yield of 700 to 800 lb. per arpent.

PRODUCTION—IMPORTS AND EXPORTS 1940-49

Year	Production		Imports	Exports
	Black Tea lb.	Green Tea lb.		
1940	152,900	—	218,680	—
1941	232,100	—	318,560	—
1942	277,420	—	185,900	—
1943	381,040	—	149,820	—
1944	400,484	—	92,431	—
1945	333,036	—	65,019	—
1946	489,624	—	158,818	—
1947	544,959	2,456	170,377	—
1948	617,322	2,454	126,845	12,850
1949	658,274	3,380	35,537	33,917
1950	749,193	3,972	86,849	47,986

The imports for the year amounted to 86,849 lb. of which some 79,000 lb. came from Ceylon and 5,500 from Hong Kong.

Exports of tea which had made a good start during the last quarter of 1949 went on steadily until March 1950. During the first quarter of 1950, some 45,000 lb. were exported mainly to the United Kingdom, the United States of America and the Union of South Africa. Prices offered from March onwards were not remunerative and the exportation ceased abruptly, except for 2,255 lb. sent to Seychelles in December, 1950.

Tea planters are looking forward with great interest to the opening of the London Tea Auctions in April 1951.

The future development of the Tea Industry in Mauritius is closely linked with an export market offering certain minimum guarantees. The consumption of tea is steadily increasing and is now probably over 700,000 lb. per annum. The average figure for the last three years calculated thus.

Production + Imports—Exports gives an approximate consumption of 730,000 lb. per annum. Taking the population at 460,000, the consumption is 1.6 lb. per head per annum. There is still room for improvement and it is estimated that the figure of 3.0 lb. per head per annum could easily be reached with a little propaganda.

Tea Committee. The first Tea Committee, set up under Ordinance 51 of 1949, held its first meeting on the 24th April, 1950. The Committee held 7 meetings during the year and dealt mostly with the contemplated reconstruction of small factories, the issuing of permits for tea planting, the Tea Buying Pool, Tea Propaganda, Imports and Exports.

Tea Factories. Following the recommendation of the Tea Committee, Messrs. Ramparsad Ramdin, Raoul Corson, Rajcoomar Ramdin and L. Madhoo submitted plans for the reconstruction of their respective factories. Three of those plans have been approved by the Committee and Mr. Ramparsad Ramdin has already started building his new factory.

Two withering lofts have been super-imposed on the existing factory of Bois Chéri, and other modifications are being undertaken to the shifting and grading rooms and to the rolling room. The table below shows the production (English pounds) of the different factories during the period 1945-50:—

<i>Tea Factories</i>	1945	1946	1947	1948	1949	1950
Bois Chéri... .. (L. Larcher)	158,870	182,225	211,866	230,454	245,719	335,447
Curepipe Tea Factory ... (Raoul Corson)	110,309	149,130	174,226	185,927	223,916	231,764
Avenir St. André (Ramp. Ramdin)	44,136	77,132	80,533	94,917	97,093	74,640
Pont Colville (Raj Ramdin)	49,257	52,024	55,532	71,645	62,328	64,618
Nouvelle France (L. Madhoo and Sons)	20,464	29,113	22,803	34,379	29,219	42,724
Total Black Tea	383,036	489,624	544,960	617,322	658,274	749,135
Green Tea (R. Aubeeluck)	—	—	2,456	2,454	3,380	3,972
TOTAL TEA	383,036	489,624	547,416	619,776	661,654	753,16

Labour. Labour was recruited from the neighbourhood of the plantations or in some cases, from elsewhere when they were transported by lorry. This latter system of transport of labourers by lorries is becoming more and more common on tea estates.

Due to the shortage of labour during the flushing months, a considerable amount of leaf is lost (unplucked in the field). Further the flat plucking surface cannot be maintained and weeds are allowed to grow unchecked for several months. The first weeding in such neglected fields is known to have cost as much as Rs. 30—Rs. 40 per acre.

When there is an acute labour shortage during the cropping months (November-March), it is wiser to abandon certain areas rather than try to pluck the whole estate at very wide intervals. The abandoned fields should preferably be those that are going to be pruned in the next April or May (i.e.) running their second year, in a two-year pruning cycle). These fields should be the first to be pruned. It has been brought to my knowledge that an estate had to abandon 55 acres in that way in December, 1950.

Tea Seeds. The importation of tea seeds from Malaya was discontinued in December, 1949, due to the appearance of Blister Blight (*Exobasidium vexans*) in that country. Fruitless efforts were made to obtain seeds from East Africa, and we must now rely entirely on our own seeds.

Crown Land Montille—5 arpents. This area was manured and weeded regularly: 800 lb. (10 maunds) of seeds were harvested in March and April. Part of the seeds were sold to planters at Rs. 1 per lb. and the rest was planted at Crown Land Wooton.

Parc-aux-Cerfs. This tea seed-bearer plot (9 arpents) which was planted in 1949 from Malayan seeds is making good progress, but no seeds can be expected from this area for several years to come.

The whole area had to be fenced in June to prevent stags from walking through and nibbling the young shoots of the tea plants.

Grevillea robusta (Silver Oak) has made good growth in that area, and the *Tephrosia candida* showed excellent cover over approximately 3 arpents. Seeds of *Tephrosia candida* were collected in March and April. Some 3 arpents more have been planted with this legume at Parc-aux-Cerfs.

Crown Land Wooton. This was the main centre of activity throughout the year.

Field No. 1—4 arpents. This area was mechanically cleared in November, 1949, and planted with Malayan seeds at the beginning of 1950, *Grevillea robusta* was planted throughout. *Tephrosia candida* was sown on two occasions in every second row. The seeds germinated well but the seedlings died out, soon after, without any apparent cause. This area is very poor and shows many vacancies, the reason being that the top soil has been disturbed and pushed away by the bulldozer.

Field No. 2—5 arpents. The land was cleared by hand, drained, holed and planted with Malayan seedlings from the nursery by means of the Hersall Transplanter. Half the area was planted $3\frac{1}{2}' \times 3'$ and the other half $3\frac{1}{2}' \times 2\frac{1}{2}'$. *Grevillea robusta* was interplanted. This field has made good growth and plants look healthy, *Tephrosia candida* was also planted in every second row, with the same poor results as in Field No. 1.

Both fields Nos. 1 and 2 were manured in July,

Field No. 3—5 arpents approx. Part of this area was cleared of Jambrosa stumps by bulldozer. The bulldozer simply uprooted the stumps but did not line them up as in Field No. 1. This field was drained, holed and planted with germinated seeds-at-stake. The seeds came from Crown Land Montille. *Grevillea robusta* was planted but *Tephrosia candida* was unsuccessful here again.

A section of Field No. 3 demonstrates the method of contour planting.

New Clearing. Two new areas of 5 arpents each have been cleared. One of them has been drained, terraced, lined and holed; it is now ready for planting. Part of this field has been laid as a demonstration of semi-contour planting.

Nursery. A Nursery, some 60 perches in extent, has been prepared adjoining a river. Seeds from Crown Land Montille have been sown there, but many of the seedlings have been badly attacked by cut-worms.

Vegetative Propagation. Vegetative propagation was also tried in the nursery. It is still too early to know the percentage of success but many cuttings are definitely growing. Here again, cut-worms have been very active.

Leguminous plants. Various legumes such as *Tephrosia candida*, *T. Vogeli*, *Crotalaria anagroides*, *Cajanus indicus*, *Canavalia ensiformis* and several *Erithryna* species (*Dadaps*) are being tried in the nursery.

Preliminary experiments are being carried out to find out the cause of the failure of *Tephrosia candida* at Crown Land Wootton. The results so far seem to show that *Tephrosia candida* can be made to grow, provided phosphates are applied.

J. BROUARD,
Assistant Tea Officer.

Tobacco Research Station

Weather Conditions

Rainfall was unusually low in February, but was exceptionally high during the months of April to July. The effect of the late rains on the growth of the canes was markedly beneficial and the yields of the various cane varieties were consequently very good. The wet cool conditions of June and July were, however, very favourable for tobacco mildew, which disease almost ruined an otherwise good plantation of tobacco.

Owing to repairs effected to the main distributory canal of La Ferme during the first six months of the year, the supply of irrigation water to the Station was frequently interrupted for periods of one to three weeks. In addition, the supply of water was decreased by over 50 per cent during the two last months of the year.

The meteorological statistics for the year are as follows:—

RAINFALL

Months	No. of rainy days		Inches	
	1950	Mean 1939-49	1950	Mean 1939-49
January ...	11	11·2	5·72	4·17
February ...	9	11·8	0·78	6·15
March ...	21	12·6	7·66	6·00
April ...	17	10·0	3·55	3·99
May ...	6	7·1	1·93	1·30
June ...	11	8·4	1·93	1·00
July ...	13	9·4	1·10	1·11
August ...	5	7·2	0·24	0·49
September ...	9	7·1	0·38	0·72
October ...	2	3·9	0·30	0·63
November ...	6	6·1	1·73	1·78
December ...	7	9·7	2·01	4·51
	117	104·5	27·3	31·85

TEMPERATURE (°FAH.)

	Monthly Mean				Absolute				Mean relative humidity %	
	1950		1942-49		1950		1942-49		1950	1942-49
	Max.	Min.	Max.	Min.	h.	l.	h.	l.		
January...	85	77	84·9	77·0	90	69	91	70	64·2	64·24
February ...	85	78	85·2	76·9	90	71	93	67	64·2	65·15
March ...	83	76	84·4	77·0	87	68	91	67	71·5	67·77
April ...	81	75	84·6	75·6	86	68	88	62	67·5	67·54
May ...	79	71	79·9	72·0	84	61	90	60	62·7	66·31
June ...	76	70	76·9	69·4	79	61	84	57	66·1	65·12
July ...	73	67	75·1	67·7	79	60	83	58	65·6	65·27
August ...	75	68	75·9	67·7	80	58	82	55	65·8	64·32
September ...	76	68	76·7	68·5	80	60	84	56	58·2	60·59
October ...	79	72	79·1	70·6	84	59	87	60	59·4	57·04
November ...	82	74	82·0	72·4	87	65	88	62	63·5	58·55
December ...	84	70	84·2	75·4	88	68	90	66	64·2	62·11
Mean ...	80	72	80·5	72·5	90	58	93	55	64·4	63·67

Read highest for *h* and lowest for *l*.

Tobacco

In consequence of the reduced supply of irrigation water at the Station, the tobacco work here consisted chiefly of the production of seed for growers' use and of test of newly imported varieties. A 2-acre field was planted with Amarello and allied varieties and another field of 2 acres with Burley and Virginian varieties.

A. Amarello field

(a) *New Introductions.* Two Amarello strains were received from Onderstepoort, Union of South Africa, and planted in two plots at the Station at the end of January. The initial growth was good but both strains proved to be very susceptible to Black Shank (the major fungoid tobacco disease of the Island). The 219-2-3 strain was an Amarello broad leaf type with leaf of a golden colour which cured out very bright in the barn. The other strain, 288, proved to be of the Virginian flue-cured type, very distinct from the heavy Burley type to which Amarello belongs. Most of the plants selected for seed were killed by Black Shank but one selection of Amarello 219-2-3 remained healthy and showed no sign of infection when uprooted after harvest. Seed collected from this plant will be sown next season.

Seed of White Amarello was received from Guntur, India. The variety was planted out in April and did not make very good growth during the subsequent cool months. Its performance was below that of the same variety cultivated at the Station since 1946.

(b) *Progeny plots.* The progeny of the best selections of 1949 of Amarello broad leaf and Amarello pointed leaf were planted out at the end of January. The early growth was good and the percentage of vacancies was small. Snails caused some damage to the younger plants but this incidence was reduced by frequent applications of meta and maize bran around the field. Black Shank was prevalent in some strains of Amarello pointed leaf. Some strains of Amarello Broad Leaf having showed signs of deficiency, a top dressing of Potassium Sulphate was made and the appearance of these strains was completely changed.

A good quantity of leaf was harvested and an average yield of 6,034.5 kilograms of green leaf per acre was obtained for Amarello. Some 130 plants were selected in the various strains of Amarello Pointed Leaf and Amarello Broad Leaf and their flower heads bagged. After germination of the cured leaf and of the roots, the best selection in each strain was kept for testing in 1951.

Mass selection was carried out in the best strains and a good supply of seed was obtained.

(c) *Amarello hybrids.*—(i) The following hybrids with Bonanza $\times$ Amarello bloods and vice versa, namely $\times 4-42$, $\times 5-42$, $\times 6-42$, $\times 10-42$, $\times 11-42$ which are homozygous for their vegetative characteristics, were planted out in progeny plots in January. The $\times 4-42$ and $\times 5-42$ plots suffered severely from Black Shank disease. The other hybrids showed

high resistance to this disease. Thirty five selections were made in these hybrids ($\times 5-42$ was discarded) and one selection of each hybrid was retained for further tests next year after the examination of the roots and cured leaf.

(ii) Eight Amarello hybrids (V. series) with Oxford I and Oyford III bloods together with 6 Amarello hybrids (S. series) with Rg. blood were also planted out in progeny plots for selection work. All these hybrids showed high resistance to Black Shank. Five selections in each of 4 hybrids of the V. series as well as 5 selections in each of 3 hybrids of the S. series were made. These selections were also back-crossed to Amarello. The best selection in each of these hybrids together with its back-cross will be planted next season for further work.

B. Flue-cured Variety Field

(a) *New Introductions.* The following varieties namely Bonanza, Jamaica Wrapper, White Stem Orinocco from Rhodesia, Bonanza (68/N), Jamaica Wrapper 54, Delcrest 102 T from Canada and Bonanza, Chatham and Yellow Special from India were received at the Station in January and February this year. These varieties were planted out in observation plots at the end of March and the varieties from India planted at the end of April. These varieties were uniform for type and growth; the percentage of vacancies was small. The incidence of Black Shank was not great except the Variety Delcrest which suffered severely from this disease. Some mosaic disease started in the plot planted with the Indian Varieties. The Mosaic plants were removed. Mildew infection was heavy due to the wet cool months of June and July. The cured product showed a high proportion of perished grades.

Ninety selections were made in these new varieties and after examination of the cured leaf and roots only one selection was kept in each Variety for testing in 1951.

(b) *Flue-cured Variety Selection.* Progeny plots: Plots of the varieties Bonanza, Jamaica Wrapper, Virginia Bright, White Mammoth, Yellow Mammoth, White Stem Orinocco, as well as 9 other minor varieties were planted with the progeny from the selected plants made in 1949, the varieties Bonanza and Jamaica Wrapper occupying .77 acre out of 1.16 acres planted. The general growth and vegetative characteristics were uniform. Black Shank disease caused very slight damage to these varieties, but Mildew did considerable damage which almost ruined this very look-see plantation. White Fleck also caused some damage to the leaf. An average yield of 3178.8 kilograms per acre of green leaf was recorded.

Rigorous selection, for type, yield, quality and resistance to Black Shank and Nematode was continued in all these varieties. About 10 selections were made in each of the strains planted. The selection technique adopted was the same as described in the section for Amarello selections. The seed of plants showing desirable characteristics of leaf properties and resistance to Black Shank and Nematode will be sown next year.

Mass selection was made mainly in the plots of Bonanza, Jamaica Wrapper and Yellow Mammoth in order to provide seed for tobacco growers. An ample supply of seed was obtained in this connection.

Black Shank Resistant Hybrids Fifteen hybrids of the S. Series were planted out in progeny plots at the end of April for selection work. These hybrids showed great vigour and considerable resistance to the disease. Some of them were almost uniform for type and vegetative characteristics. Mosaic was prevalent in some of these hybrids. Mildew caused some damage to the leaf as well as White Fleck.

Some 66 selections were made in all these hybrids. They were back-crossed to their male parent varieties. The best selection in each of the hybrids was kept for further work next year.

White Burley Progeny Plots. The progeny of the best selected plants made in 1949 were planted out in progeny plots. This plantation was better than that of last year as regards uniformity of growth and type. Black Shank caused slight damage to this plantation. An average yield of 7184.1 kilograms of green leaf per acre was recorded. Thirty-five selections were made and after examination of the roots and cured product, the seeds of only 7 were retained for further tests.

Mass selection was carried out in these plots for seed purposes.

Air-cured Hybrids Nine air-cured hybrids were planted in progeny plots for selection work. These hybrids suffered severely from Mildew. Twenty one selections were made in 7 of these hybrids. The best selections in each of the hybrids were kept for testing in 1951.

Leaf Curl Disease. Leaf Curl Disease made its appearance for the first time at the Station. One diseased plant in the Amarello field and another in the flue-cured variety field were detected. Both cases were inspected by the Plant Pathologist of the Department of Agriculture. The diseased plants were consequently uprooted and burnt.

Tobacco Seed. A very good amount of seed was obtained at the Station this year for distribution to tobacco growers for the 1951 season. Seed was collected mainly from the Virginian Varieties Bonanza, Jamaica Wrapper, Yellow Mammoth, Amarello Pointed Leaf, Amarello Broad Leaf and White Burley. The flower-heads of the best plants were bagged and seed was collected only from the healthy plants of each variety. The seed was bulked and graded. The Tobacco Board, which issues seed to tobacco growers, free of charge, was provided with the following quantities of seed:—

			grams.
Amarello Broad Leaf...	...	5,000	
Amarello Pointed Leaf	...	3,000	
Bonanza	...	5,000	
Jamaica Wrapper	...	5,000	
Yellow Mammoth	...	1,000	
White Burley	...	2,000	
			—
TOTAL	...	21,000	
			—

Rotation crops. The planting of sugarcane in rotation with tobacco was continued. Two fields (about 4 acres), which had been under tobacco this year, were planted with sugarcane in September. In addition to the various varieties planted at the station, namely: M. 134/32, M. 112/34, M. 63/39, M. 76/39, M. 165/38, six varieties from Barbados and M. 423/41, M. 213/40 were also introduced. The area under sugarcane at the end of 1950 was 22.74 acres.

The harvest of cane was started on 31st July 1950 and completed on 11th November 1950. 807.38 tons of cane were sent to Medine Factory. The average yield was slightly over 30 tons per acre. The rains which fell during March to July had beneficial effects on the canes.

The virgin canes of variety M. 423/41 (44.025 tons) were sold to growers through the Sugarcane Research Station.

The harvest of the groundnuts planted in the interrows of the new cane plantations in 1949 were completed in January. The total yield obtained was about 1,400 kilograms (mean yield: 200 kilograms per acre).

Seed of 8 strains of Sorghum from the preceding year's plantation was planted at the Station on behalf of the Sugarcane Research Station. The plots were very uneven due to rather severe attacks of borer. Ten ears were bagged in each strain for seed purposes.

Seeds of Sunn Hemp, Pois Mascate and Pois Sabre were planted as a green dressing in the nursery as usual.

A small Rice plot was planted out at the Station in November from seed received from Madagascar on behalf of the Director of Agriculture. The rice seedlings have been protected against birds by wire netting. We cannot submit any report at this early stage but may say that the seedlings are coming on well.

Miscellaneous

Weed Control. The weed control experiments were resumed in May at the Station by the Acting Botanist Sugarcane Research Station. Plots of Chiendent were sprayed with 10 per cent and 15 per cent solution of Sodium Chlorate. An area of about $\frac{2}{3}$ acre was also sprayed with a 15 per cent solution at the rate of 100 gallons per acre. Twenty kilos of Sodium Chlorate were supplied, free of charge, by Messrs. Scott & Co. to whom we are much thankful. The results will be submitted by the Sugarcane Research Station.

Orchard. The creation of a mixed orchard was started in October at the Station under the guidance of the Agricultural Officer (Mr. J. H. Julien). It will consist chiefly of Mangoes, Letchis, Avocadoes, Bread Fruits and few other fruit species.

Overhead Irrigation. The equipment of Overhead Irrigation from Messrs. Landsborough Findlay of South Africa was received at the Station towards the end of July.

Buildings. The construction of two new gundry furnaces for two barns started at the end of last year was completed in January. A new stable was also erected for the donkey.

Bulls. At the end of the year there were five young bulls at the Station, kept on behalf of the Government Dairy for manure purposes.

Staff. The post of Government Tobacco Officer remained vacant throughout the year, the writer having been appointed thereto in an acting capacity since January 1948. The members of the staff comprising the Senior Research Assistant, the Junior Research Assistant, the Clerical Assistant, the Overseer and the Breeding Assistant were on duty throughout the year.

The Senior Research Assistant, Mr. L. Suzor, having been awarded a Scholarship under the Development and Welfare Fund, left the Colony on the 23rd December, 1950, for Rhodesia and Nyasaland on a study trip. The object of the award is to enable that officer to acquire a broader experience in the tobacco industry for the future benefit of the local growers.

Revenue

The following is an account of revenue collected at this Station during the year ended 1950:—

									Rs. c.
Tobacco seedlings	...	...	...	...	...	...	...	...	208 50
Tobacco leaf	...	...	...	...	...	...	...	...	3,363 49
Canes for planting (thro' the Sugarcane Research Station)	...								2,653 50
Groundnuts to Controller of Supplies	...	...	...	...					788 13
Cane sold to Medicine Factory (807·38 tons)...	...	...	...	...					amount of sale not yet available.

E. LESUR,

Acting Government Tobacco Officer.

Entomological Division

Pests of Sugarcane

*The Sugarcane White Grub, *Clemora Smithi* (Arrow).* As described the Annual Report for 1949, a Benzene hexachloride dust containing 2.6 per cent of the gamma isomer was applied to five plots of virgin cane well before the flying season of the beetle. The methods of application were by dusting the open furrows at planting time, and by dusting in a band along the cane rows after germination. During the 1950 larval season the infestation of these plots was estimated by digging a number of randomly placed trenches along the cane rows; each trench was 3 feet long and the cane stools they encompassed were uprooted and torn apart so that larvae among the roots were not overlooked. The diggings were repeated in the untreated portion of each field which contained an experimental plot. The experiments and their results are summarised in Table I. The means for grubs per trench are derived from twenty trenches in the first three trials, and from fifteen in the two latter.

TABLE I

Locality	Area treated	Method of application	Application		Mean number of sprigs per trench		Yield of cane Kilos per arpent or kilos per arpent		Remarks
			Rate	Date					
			Kilos per arpent		Treated area	Untreated area	Treated area	Untreated area	
New Grove	... 1/2 arpent ...	In open furrows	... 75	5.9.1949	1.8±3.4	6.7±4.6	10,580	11,400	Cane cut early for tops.
Bel Etang ...	...	In open furrows	... 75	17.8.1949	0.5±0.7	3.0±2.3	35,210	33 34,843	
Bonne Mère	... ..	In open furrows	... 50	7.9.1949	0.8±1.8	2.7±2.1	34,400	(a) 38,300 (b) 35,600	
Beau Vallon	... ..	Along rows after germination	50	25.6.1949	2.3±3.3	7.1±5.4	620 49,900	44,400	
Beau Vallon	... 1/4 arpent ...	Along rows after germination	100	20.6.1949	1.6±1.4	7.1±5.4	40,400	44,400	

1 arpent = 1'043 acres.

It is seen from the Table that all treatments were effective in diminishing grub infestation. The yield of cane, however, was not appreciably affected either way in any of the trials. This is probably due to the low infestation in the trial fields.

Benzene hexachloride when in close contact with the roots of graminaceous plants, is known to adversely affect their growth. The figures for yield of cane when the insecticide was placed in the open furrows do not, however, illustrate any adverse effect, although as stated in the 1949 Report, the number of tillers had been reduced (in the first trial tabled).

An experiment was laid down during the year with the object of obtaining more information about the effect of B.H.C. upon the growth of virgin cane.

To sum up the results of experiments with B.H.C. to date, it can be said that when applied before the adult season of *Clemora*, either to the open furrows at planting time or to the soil surface with established cane, at the doses tabled, infestation is reduced, and while there are signs that there is retardation of early growth of the cane with the former method of application, the final yield of cane does not seem to be materially affected by such retardation.

It is clear that the results of more extensive trials are necessary. It is hoped to obtain these with the co-operation of Rose Belle Sugar Estate where about 20 arpents have been treated, along the above lines, during the year.

There is a drawback to the use of B.H.C., as described, which cannot be passed without mention. It is that application is necessarily a preventive measure for it must be carried out before the adult season of the beetles. As it is not possible to forecast where an attack will occur, the cost of treatment must therefore be low. It is not so at present for the cost of 50 kilograms of the B.H.C. dust in use is roughly equivalent to the value of about 2 tons of cane.

Apart from these experiments with B.H.C., efforts were made to further the biological control of *Clemora* by the introduction of the giant toad, *Bufo marinus* L., which was previously introduced in 1938 but did not become established. Two consignments of toads were sent by air from Trinidad by Dr. F. J. Simmonds of the Commonwealth Bureau of Biological Control, these were received in December and more are expected. The first consignment was of 60 toads and 56 arrived in excellent condition, but the second consignment of 121 toads suffered in transit and only 19 were received alive. All were released in one locality.

Estates were again encouraged to plant *Eupatorium* among cane fields as food-plants for the Scoliid parasites of *Clemora*, and to assist their efforts plants propagated by the Agricultural Division were distributed, at first free of charge, and later at a cost of 10 cents per plant. About 20,000 young plants were so distributed.

Sugarcane Moth Borers. The work with these pests has been carried out by the Associate Entomologist.

Several rather severe attacks of *Sesamia viteria* Stoll., and *Olethreutes schistaceana* Snell., occurred in the upcountry, while *Proceras sacchariphagus* Boj. was, as usual, the most important of the three borers in the lower dry regions. Visits were paid to planters and advice given whenever necessary.

A study of the egg parasites of the borers has been completed and the details will form a paper which is in preparation. *Trichogramma australicum* Gir. was found to parasitise the eggs of all three species but chiefly those of *Proceras*. Field data indicate that its incidence in *Proceras* infested areas is very localised and erratic, and the mean percentage of parasitised eggs throughout the year is very low. *Platytelenomus*? *hylas* Nixon, which has previously been recorded as *Prophanurus alecto* Craw., was found to attack only *Sesamia* eggs, but again the percentage of eggs parasitised is generally low. Both of these parasites are more numerous in the cool season.

Investigation of the larval and pupal parasites was continued, but is yet incomplete.

Attempts were made during the year to introduce, with the aid of the Commonwealth Bureau of Biological Control, the West Indian borer parasites *Microdus* (*Bassus*) *stigmaterus* Cress., *Apanteles diatraeae* Mues., and "a *Telenomus* sp." The consignments were, however, small and few while the condition of the insects on arrival was poor, so that only the latter species could be released. About 70 adults were released in fields attacked by *Proceras*. It is hoped to obtain larger consignments of these insects in the coming year.

Quarantined cane. Despite a modern quarantine greenhouse, mites, thrips, mealybugs and aphids are repeatedly found on the quarantined canes. As immediate measures are always taken to suppress these insects the cane suffers no injury, but their entry means that the possibility of a disease vector feeding upon the canes and then escaping is not absolutely precluded by the quarantine precautions. As an added precaution against such an occurrence the application of systemic insecticides to the canes was considered. Experiments were first made with sodium selenate, but they were quite unsatisfactory. Early in the year samples were received of the newly discovered systemic compound bis (bis dimethylamino phosphorous) anhydride, known commercially as Pestox III, and trials with it were commenced. Canes were planted in drums according to the procedure used in the quarantine greenhouse, and when they were 4-5 months old and infested with aphids and coccids, solutions containing respectively 6.5 ccs., 13 ccs., 26 ccs. and 40 ccs. of the 30 per cent anhydride were poured on the soil of the various drums. Against *Trionymus sacchari* (Ckll.) and *Pulvinaria elongata* Newst., the treatment were not effective, but against *Aphis sacchari* Zehnt. all were equally effective and strikingly so. Heavy infestations of this aphid disappeared within a week of application (usually by the fifth day) while the verdose had been used, furthermore the canes remained absolutely free of

infestation until observations were discontinued $4\frac{1}{2}$ months later, by which time the canes were suffering severely from nematode attack. Throughout this period of immunity, adjacent control plants were heavily infested so that re-infestation of the treated canes was always possible, more so as the aphids were tended by ants which nested in the drums. None of the doses used produced any injurious effects on the canes. Consequent on these results Pextox III is now in use in the quarantine greenhouse, from where more data will be obtained in due course.

Minor pests. A localised attack, covering about two arpents, of the army worm *Leucania loreyi* Dup. occurred at Highlands in December. Collections of larvae were made and the following parasites were recorded for the first time from this host—*Paniscus melanocotis* Hlgr. *Enicospilus* sp., *Disophrys iridipennis* Cameron, and *Chelonus* sp.

Control of the Black sage, *Cordia macostachya* (Jacq.)

A detailed account of *Schematiza cordia* Barb., the Galerucid beetle which was introduced from Trinidad and which has now exerted such considerable control of *Cordia*, has been published elsewhere.* Only a brief account of its activity will therefore be given.

The beetle was again very active during the summer and scrub continued to be stripped of leaves and inflorescences. Most of the dense growths of *Cordia* in the island have now been subjected to this severe treatment. The stripping of bushes of all their green parts causes the branches to die back from their tips, and when attacks are sustained so that fresh growth is prevented, the die back continues until most branches are dead, and often until the whole bush dies. Small bushes, of course, die most rapidly. Much scrub has been killed in this manner, while in addition, a good deal has been enveloped by other vegetation which could not previously compete with *Cordia*. Climbing plants often spread in such masses over the dead or partially dead branches that the bushes are borne to the ground. In some places the shrub *Lantana camara* has succeeded *Cordia*. Fruit production has been drastically reduced by these intense attacks, while also partial defoliation, combined as it is with direct inflorescence attack has a similar effect. Lighter injury of this nature is mostly confined to small patches of scrub, road-side bushes, etc. In general the abundance of *Schematiza* has been less than last year and it is evident that the insect-plant balance is rapidly stabilising. No parasites or predators, in addition to the previously recorded *Afrinus* sp., have been found to attack *Schematiza*.

The establishment of the seed infesting Chalcidoid, now identified by the Commonwealth Institute of Entomology as *Eurytoma* sp. nr. *howardii* D.T., was continued during the year. As described in the previous Annual Report, the *Eurytoma* were selected from the various emergents from Trinidad *Cordia* seeds and released after a brief retention for mating to occur. Between August 1949 and April 1950, about

* In the Bulletin of Entomological Research. Vol. 42.

2,332,000 seeds were received from Trinidad through the agency of the Commonwealth Bureau of Biological Control and from these approximately 1,300 females and 900 males were obtained. Most of these were released at Réduit in the vicinity of the Department of Agriculture. As soon as it became apparent that the insect was established in this area, the stock of Trinidad seeds was destroyed to obviate further risk of undesirable parasitic species escaping. Dispersion of *Eurytoma* has since been effected with adults collected in the field at Réduit. At the end of the year, about 4,300 females and 1,660 males had been collected and released elsewhere, and there are now six localities where the insect is known to be established and spreading.

The following are the salient features of the biology of *Eurytoma*. Parthenogenetic reproduction will occur if a female is unmated, and the progeny which result are male. The female inserts its ovipositer into a green fruit before the endocarp has hardened and deposits an egg just within the seed coat. The larva then develops within the seed (there is usually only one seed per fruit) and by the time it is fully grown the seed is completely consumed. The infested fruit has meanwhile developed normally and its endocarp become stony, but at this point development stops, so that its mesocarp does not become red and fleshy. Pupation occurs in the cavity which was occupied by the seed and the adult when emerging chews a round exit through the hard endocarp. In summer, the complete life cycle lasts about 23 days and the adults emerge from the fruit while it is still attached to the inflorescence stalk. In the winter months when the fruit production of *Cordia* falls considerably, the mature larva passes into a resting stage. At Réduit this lasts from June to October so that fruits containing the resting larvae fall to the ground long before the life cycle is completed.

It is yet too early to assess the beneficial action of *Eurytoma*, but its progress at Réduit, where it has been established longest, has been closely followed and its activity here will undoubtedly give an indication of its future value. In May, just before the resting stage began, the adults had become very abundant and were flying in such numbers as to make collections amounting to several hundreds of this very small insect quite easy. In October, they again became numerous, and since that month fortnightly samples of hard green fruits were dissected to assess the degree of infestation. Commencing with the sample collected on October 31st, the percentage of infested fruits was respectively 37 per cent, 34 per cent, 58 per cent, 47 per cent and 53 per cent. There is thus every indication that *Eurytoma* will prove a valuable ally of *Schematiza* and will supplement the control exerted by that insect.

Micellaneous introduction of beneficial insects.

(a) Red Spider must be considered one of the major food crop pests of the Island, although during the year under review there were less attacks reported than in 1949. Since the local coccinellid, *Stethorus punctatus* Kapur is clearly a valuable predator, it has been decided to

experimentally introduce other member of this genus which prey upon mites, and in December, through the kind assistance of Dr. Naude, Division of Entomology, Pretoria, a consignment of the South African *S. jejunus* Casey was received. Of nearly one thousand sent, six hundred were received alive and these were released in two localities. It is hoped that other species will be introduced in due course.

(b) Also through the courtesy of the Division of Entomology Pretoria, two consignments of *Cactoblastis cactorum* eggs were received. The object of this introduction was precautionary, to ensure the continued suppression of *Opuntia tuna* Mill., for in a few regions the plant seemed to be increasing somewhat in numbers. The first batch of 12,000 eggs arrived in February, and the second of 21,600 in March. When about to hatch they were attached to prickly pear plants in several regions. The first generation was completed in early November and the insect is now in its second generation,

(c) Six consignments of the *Musca* predator, *Pachylister sinensis* (Histeridae) were obtained during the year from the sub-station of the Commonwealth Bureau of Biological Control in Trinidad. They comprised a total of 535 adults, and of these 335 were received alive and released.

Pests of *Cajanus cajan* (Pigeon pea : Ambrevade)

An experiment with wettable DDT was carried out to determine the possibility of controlling the flower and pod boring lepidoptera which have been named in the 1949 Report. Five plots, each of 24 bushes, were marked out of a field of *Cajanus* at Reduit. The bushes were in their first year of growth. Two plots were used as controls and the other three were sprayed with 4 gallons of 1 per cent, 2 per cent, and 4 per cent DDT respectively. Application was made with an Ondine high pressure sprayer in early June when the bushes were in flower, but before many pods had formed. Results were assessed by collecting all the pods produced in the plots when they were dry and fully mature, and by assessing at each collection the percentage which were bored and the percentage of their seeds which were attacked.

The results are given in the following Tables :—

TABLE II
POD PRODUCTION

				Control		DDT		
						1%	2%	4%
1st collection (27.7.50)	...	...	...	456	414	773	1,440	825
2nd do. (29.8.50)	...	...	...	665	1,215	1,915	5,625	6,320
3rd do. (28.9.50)	...	...	...	1,070	880	933	1,775	2,000
TOTALS	...	...	...	2,181	2,509	3,621	8,840	9,145
Average number of pods produced per bush				...	97.7	150.9	368.2	381.0

TABLE III
POD AND SEED ATTACK

Collection	Control				1%		DDT 2%		4%	
	*a	b	a	b	a	b	a	b	a	b
1st (27.7.50) ...	97.6	95.1	97.7	85.7	93.3	79.3	75.5	60.0	63.3	45.2
2nd (29.8.50) ...	93.3	75.0	91.0	68.3	95.5	74.8	87.7	65.0	83.3	63.6
3rd (28.9.50) ...	77.7	61.0	87.7	62.2	92.0	72.8	78.8	63.6	73.3	53.0

The figures show that spraying appreciably increased pod production by reducing the degree of flower attack, the 2 per cent and 4 per cent DDT treatments being decidedly more effective than the 1 per cent DDT treatment. The reduction of pod and seed attack is, however, almost confined to the first pods which matured, i.e., those of the first collection. This is understandable because pods formed after spraying will have little protection from the spray residue.

The average number of seeds which are set per pod is 4.5, and using this figure and the data in the Tables, the actual yield of seeds per bush for each treatment may be estimated, e.g., the number of dry seeds produced per bush for the 4 per cent DDT treatment at the first collection is $\frac{82.5}{24} \times 4.5$ less 45.2 per cent. The overall results, expressed as the estimated number of dry seeds produced per bush throughout the season are thus:—

Control	Control	1% DDT	2% DDT	4% DDT
121	138	180	626	692

General

(a) A Committee to advise on the protection of stored produce against pest infestation was created during the year. The Director of Agriculture was represented on this Committee by the Entomologist. Two meetings were held and the storage of foodstuffs at the granary was considered. Various recommendations of a preventive nature were made, while the installation of an aerosol generator for routine treatment of the stores was agreed.

(b) Lectures in Entomology were delivered throughout the year to students of the College of Agriculture by the Entomologist.

(c) As usual, planters were visited and advice on the control of pests given whenever requested.

Acknowledgement

The constant support of all members of the Entomological Division is acknowledged with gratitude.

J. R. WILLIAMS,
Entomologist

* Read; for (a) % pods bored; for (b) % seeds attacked

Plant Pathology Division

Staff

The Division continued to work under reduced staff during the year, no appointment through shortage of suitable candidates having been made to fill the post of Scientific Assistant, vacant since August, 1949. The remarks made in the previous Annual Report still therefore apply as to research work having been handicapped.

Diseases of the Sugarcane

No outbreak of importance of any major cane disease was observed during the year, due no doubt both to the resistance of the varieties under cultivation to the chief sugar cane diseases present in the Island and to the highly favourable growth conditions experienced during the year. It appears that such diseases as gumming, leaf scald, and smut, although they are not looked upon as having yet been eradicated from the Island, have come down from a rank of primary importance to one where they can be practically ignored. Due to the growth conditions reported and the absence of cyclones, red rot attacks have been remarkably rare this season.

Chlorotic streak is apparently at a standstill, but it would be desirable that investigations be made as soon as possible to determine the insect vectors present in the island, as fighting the insect or insects concerned could become necessary in affected areas, should the disease assume greater importance in the future.

During the inspection of variety trials cultivated by the Sugarcane Research Station on sugar estates, the new cane variety M.213 +0, about to be released, was found to show decided susceptibility to the disease referred to in the past as Stem Deterioration, and probably identical with that known elsewhere as Internal Stem Necrosis, Internal Break-down and Sclerotic disease. The disease, characterized by the presence of black patches of lignified parenchyma cells in the pith, is apparently worse in tall canes, chiefly those which have passed to flowering stage. A small number of analyses were made by the Sugarcane Research Station at the request of the Division, which indicated that it results in lowered juice purity and sucrose content in affected canes. It was of sometimes frequent occurrence on the White Tanna cane in the Island in the past, and was also occasionally encountered on some other varieties; its exact cause is unknown, the present general tendency being to consider it as a non-infectious disease, perhaps due to soil or other conditions.

A few cases of disease on sugarcane, reported in the early months of the year, were found upon investigation to have been cases of injury by lightning.

Owing to the shortage of staff reported above, and except for resistance tests against gumming disease which have become routine practice, it has not been yet possible to carry out determinations on the resistance of the new varieties produced towards the principal other cane diseases present in the Island.

"Leaf Curl" disease of Tobacco

Very few cases of the diseases were encountered this year, only eleven plants in five plantations at Triolet in Pamplémousses district, and one plant at the Tobacco Research Station at Richelieu, in Black River, having been found affected.

"Leaf Roll" Disease of Potato

A very bad outbreak of a disease with all the outward symptoms of leafroll was detected in a plantation of several acres in the interrows of young virgin canes at Piton in Rivière du Rempart district. The crop had been raised from ordinary market potatoes received from Durban.

Bad attacks of what is considered the same disease were also observed in experimental fields grown from seed received by the Department of Agriculture from South Africa.

Armillaria Disease of Tea

Diseased tea plants forwarded by officers of the Tea Division from Marc Anguilles Estate at Surinam in Savanne and from Crown Land Monty near Piton du Milieu in Moka, were examined and the attack attributed to *Armillaria mellea* (Fr) Quel., the typical mycelium of which was observed beneath the bark. The base of the trunk and the roots of affected plants become heavily fissured longitudinally, flattened strands of xylostroma with black filled margins growing up from the mycelial sheet through the cracks. The black rhizomorphs of the fungus, quite different in origin from the xylostromatic strands, were observed on some specimens for the first time in the Island. Fructifications of the fungus have never been seen in Mauritius.

The disease had spread to the tea plants from pine roots left in the soil after clearing the area a few years previously, and which were also found attack by the fungus. This points to the necessity of removing tree stumps and as much as possible of the larger roots when clearing new areas to be planted under tea. The attention of the Tea Officer was also drawn to the alternative method of ring-barking large trees in such areas and cutting them down after they have dried. By that method it has been found that the roots become so depleted in starch that they become attacked by saprophytic soil fungi, not by *Armillaria*.

Diseases of Filao

Armillaria will. A disease of young filao trees (*Casuarina equisetifolia* L.) in fields previously under wood at Réduit and Rose Hill was studied. Longitudinal splitting of the bark of the roots and lower part of the stem, with black xylostromatic strands coming out through the cracks, coupled with the presence of white mycelial sheets beneath the bark, caused a diagnosis of attack by *Armillaria mellea* to be made.

Phytophthora disease. During the inoculation work on filao with *Xanthomonas solanacearum* (Sm.) Dowson, the agent responsible for the bacterial wilt of solanaceous plants, mentioned in the previous Annual Report, cultures were made of inner bark tissue from stem regions showing external blackening, a feature of the filao common to bacterial wilt, *Armillaria* rot, and smut disease. Some of the cultures yielded a white mycelial growth which was recognised as being a *Phytophthora*.

The fungus has since been identified by the Commonwealth Mycological Institute as *Phytophthora cambivora* (Petri) Buisman, a first record for Mauritius, the filao tree being reported a new host of the fungus.

Onion Wilt

A wilt disease of onion in Grand Port, characterised by the production of water-soaked lesions on the leaves, rapid skrinking of the tissues, collapse of the affected leaves and death of the plants, chiefly if young, was studied at the request of the Executive Officer of the Food Production Board. A white bacterium was isolated, the pathogenicity of which was proved by inoculation into healthy onion plants and reisolation from the lesions produced. A complete study of the bacterium could not be effected for want of time, only its carbohydrate, milk, gelatine and nitrate reactions being investigated.

Bacterial Blight of Beans

A blight of the common garden bean, *Phacelus vulgaris* L., was investigated, also at the request of the Executive Officer of the Food Production Board, and identified as Halo blight caused by *Pseudomonas phaseolicola* (Burkl.) Dowson. The disease had already been observed in the past in the Island, but had not been identified. The causative bacterium was isolated and its pathogenicity proved by inoculation into both bean plants and bean pods.

Disease of Ginger

A bad attack of blight on ginger occurred at Crève Cœur in the Montagne Longue region. The disease had previously been attributed to a bacterium which, however, had not been isolated. The study was resumed this year and several bacteria were isolated but failed to reproduce the disease upon inoculation.

Tomato Diseases

A very bad attack by *Septoria lycopersici* Speg. occurred in a plantation at Belle Isle in Black River. The variety "Puck" showed extremely susceptibility amounting to actual death of the plants, whereas the disease was less severe on the variety "sunrise" also growing in the same field.

Leaf mould caused by *Cladosporium fulvum* Cooke is usually responsible for a certain amount of defoliation in the fields; it was reported severe in a field at Calebasses and spraying with a copper fungicide had to be effected.

Wilt of Eggplant and Anghive

A bad wilt of eggplant, *Solanum melongena* L. at Creve Coeur was investigated and its cause found to be *Phomopsis vexans* (Sacc. and Byd.) Harter. The same fungus was identified on 'grosse anghive', *Solanum macrocarpum* L. plants, also suffering from wilt in the same field. The disease is considered to have been long in existence in the Island, but to have previously escaped identification. It was encountered at various places in the Island during the year; it at times causes severe losses.

Base rot of *Gladiolus*

A disease of gladiolus occurred in a commercial plantation at Saint Pierre, characterised by a rotting of the base of the plant and resulting in death of the leaves. The disease is bad chiefly in wet weather, but the corm of affected plants often succeeds in pushing out a side shoot which may remain healthy. The symptoms parallel those of neck rot or scab, but as no exudation of gum is produced neither on the leaves nor on the corm, it is considered a different disease. A bacterium was isolated and its pathogenicity fully established. A partial study of its physiological reactions was made.

Miscellaneous diseases

The following other diseases which were encountered during the year were studied, all of them being new records for the Island :—

- | | |
|---|--|
| <i>Cabbage</i> — | Downy mildew on seedlings caused by <i>Peronospora parasitica</i> (Fr.) Tul. |
| <i>Wheat and Barley</i> — | Scab, caused by <i>Gibberella zeae</i> (Schw.) Petch, in an experimental field at Hermitage, Moka. |
| <i>Citrus</i> — | Crown gall (?)
Brown rot on <i>citrus vangasay</i> (Boj.) fruit at la Flora in Savanne, caused by <i>Phytophthora citrophthora</i> (Sm. and Sm.) Leon, under conditions of very wet weather. |
| <i>Acacia decurrens</i> Willd— | Die-back, caused by <i>Corticium salmonicolor</i> Berk. and Br. |
| <i>Persea americana</i> Mill.,
‘Avocado’— | Anthraxnose, resulting in die-back of branches, caused by a species of <i>Gloeosporium</i> . |
| <i>Pterospermum acerifolium</i> — | Perennial cankers caused by <i>Nectria hæmatococca</i> Berk. and Br., on a tree at the Royal Botanical Gardens. |
| <i>Annona reticulata</i> L.
“Bullock's Heart”— | Anthraxnose on fruit, <i>Gloeosporium</i> sp. |
| <i>Tragopogon Perrifolius</i> L.
‘Salsify’— | Collar rot, <i>Sclerotium rolfsii</i> Sacc. |
| <i>Araucaria</i> — | Cones of <i>A. Cunninghamii</i> Sw. with the scales attacked by <i>Botryosphaeria ribis</i> Gross and Dugg.
Leaf and stem blight of <i>A. araucana</i> C. Koch, seedlings was also attributed to the same fungus. |
| <i>Zinnia elegans</i> Jacq.— | Leaf spot and blight of petals, a species of <i>Macrosporium</i> in association. |
| <i>Delphinium</i> sp.— | Stem rot, probably bacterial. |

<i>Aster</i> sp.—	Bacterial blight. The pathogen was obtained in culture and its pathogenicity proved.
<i>Antirrhinum majus</i> L. 'Snap-dragon'—	Downy mildew, <i>Peronospora</i> (antirrhini). Leaf spot, <i>Phyllosticta antirrhini</i> Syd. Flower blight, <i>Botrytis cinerea</i> Pers. ex Fr.
<i>Viola tricolor</i> L. 'Pansy'—	Flower blight, <i>Botrytis cinerea</i> Pers. ex Fr. Leaf spot (consequent upon contact with diseased flowers) <i>Botrytis cinerea</i> Pers. ex Fr.
<i>Tropaeolum</i> sp., 'Capucine'—	Leaf spot, <i>Heterosporium tropaeoli</i> Bond.
<i>Calendula</i> sp.—	Leaf spot, <i>Cercospora calendulae</i> Sacc.
<i>Eschscholtzia</i> sp.—	Leaf blight, <i>Heterosporium eschscholtziae</i> Harkn.
<i>Godetia</i> sp.—	Stem rot, <i>Botrytis cinerea</i> Pers. ex Fr.

Control of Imported Plant Material.

Cane Quarantine Greenhouse. A steam sterilizing unit on the model of the sterilization outfit in use at the Cheshunt Experimental and Research Station and described in Bulletin No. 22 of the Ministry of Agriculture and Fisheries, London, was installed in the Cane Quarantine Greenhouse for steaming the soil to be used in the greenhouse.

The canes received from South Africa in November 1949, viz: Co. 419, Co. 421 and C.P. 34-120 are now in their second generation in the greenhouse. In January 1950, the following canes were received from U.S.A.: C.P. 36-13, C.P. 36-105, M.L. 3-18-1184, P.R. 905-1386, M. 336-1387 and C.P. 34-120; they are now in their first generation, save C.P. 34-120 which had already been received from South Africa and which, for want of space, had to be destroyed.

Plant Inspection at the Customs and Airport. The inspection of imported plants and plant parts continued on the same lines as previously. On four occasions, portions of sugar cane stems introduced by people unaware of the regulation prohibiting the importation of such material, were seized at the airport and destroyed. Insects found in incoming planes were collected as usual and forwarded to the Entomological Division for identification.

Proclamations issued. The following proclamations were issued during the year:—

No. 8 of 1950—To prohibit the importation into Mauritius of the sunflower plant *Helianthus annuus* L. from South America.

No. 19 of 1950—To amend Proclamation 1 of 1949 on the control of the importation of plants and plant parts.

Miscellaneous

Lectures in Botany and Plant Pathology were delivered by the Plant Pathologist and his Assistant to students of the College of Agriculture as usual, until June 1950, when through new arrangements having been made for the teaching staff to be composed principally of whole-time lecturers, the courses in Botany ceased to form part of the attributions of this Division ; courses in Plant Pathology were, however, continued by the Plant Pathologist.

G. ORIAN
Plant Pathologist.

Chemical Division

Staff

The Chemist acted as Deputy Director as from the 24th January, in June he left the Colony on leave.

As from the 24th January the Assistant Chemist acted as Chemist; and on the departure on leave of the Acting Deputy Director he was also appointed as Officer in Charge of the Control of Fertilizers of the Supplies Control Department.

The Scientific Assistant having been appointed Assistant Chemist, Medical Department, in December 1949, the post was vacant. The activities of the Division was therefore considerably reduced during the year under review. The Acting Chemist was single-handed.

Investigation Work.

Soils. At the request of the Land Settlement Officer, samples of soils were taken at Richelieu near Petit Malabar Hill in order to ascertain their value for the Establishment of small planters. The results of analyses were satisfactory.

Soil Number	...	...	1	2	3
PH	...	...	6.2	6.2	6.5
O, Matter per cent...	...	...	4.5	5.8	6.4
Nitrogen per cent	...	...	0.27	0.32	0.32
Available P ₂ O ₅ per cent	...	...	0.0056	0.0061	0.0072
Exchangeable K ₂ O per cent.	...	...	0.030	0.041	0.041
C/N Ratio	...	...	9.6	10.7	11.6

Aloe residue. Fresh residues from a number of factories were analysed with a view to ascertaining their value for Compost making:—

	1	2	3	4	5	6
Moisture per cent	88.0	88.7	91.3	91.0	90.7	90.7
Nitrogen per cent	0.085	0.12	0.12	0.095	0.12	0.10
Phosphoric acid per cent	0.018	0.018	0.073	0.051	0.067	0.035
Potassium Oxide per cent	0.29	0.36	0.39	0.16	0.31	0.31

Being given the poor value of this refuse, in fertilizing elements principally in Nitrogen and Phosphoric acid, and the fact that aloe residue, takes a considerable time to decompose, the experiment was not undertaken.

Milk. The quarterly analyses of samples of milk from the Government Dairy were performed as usual. The average figures are satisfactory;—

	Total solids per cent	Fat per cent
Morning	12.24	3.4
Evening	13.35	4.3

The series of individual tests performed at the request of the Animal Husbandry Officer to determine the variations in the butter fat contents of cows of Friesland ascendancy were continued.

The highest figure recorded was 5.9 per cent. and the lowest 2.2 per cent.

Poultry manure. A sample of poultry manure from Montebello Experimental Farm was analysed at the request of the Acting Deputy Director with the following results :

Moisture per cent.	...	...	...	14.0
Nitrogen per cent.	...	...	...	1.54
Phosphoric acid per cent	...	...	...	1.48
Potassium oxide per cent.	...	...	...	0.93

Routine analysis. Eight hundred and eight (808) samples were received involving 859 determinations.

The preparation and standardization of acid and alkali solutions for estates were carried as usual.

F. BERCHON,
Acting Chemist.

Sugar Technology Division

Visits to Factories

Twenty-seven factories and nine distilleries were visited during the year.

Advice was given where sought for and routine analytical work carried out for the factories and distilleries.

Investigations

In one factory where a considerable amount of extra fuel was being burnt daily, a full enquiry was made into the heat balance of the factory. Following the enquiry, modifications were made to the furnaces and the exhaust steam lines as a result of which consumption of extra fuel was stopped, the factory having a surplus of bagasse.

Indicator diagrams of a mill engine before and after the modification are shown in Figures 1 and 2.



Vertical Scale 1 inch = 45 lbs./m²

FIG. 1. INDICATOR DIAGRAM OF MILL ENGINE



Vertical Scale 1 inch = 45 lbs./m²

FIG. 2. INDICATOR DIAGRAM OF MILL ENGINE

It was calculated that a reduction of 20 per cent in the live steam consumption of that engine was effected.

In two factories where it had been established that during the 1949 crop serious losses had occurred through entrainment, that was remedied by placing entrainment catchers at appropriate points. The writer would like to record here that according to his experience the double vortex type of catch-all is probably the most efficient type of catch-all, provided the sections of its passages are designed to suit the working conditions.

Milling tests on new Sugarcane Varieties

Tests were made on M. 213/40 and E. 1/37 compared with the standard variety M. 134/32. The average results given in Table I show that whereas E. 1/37 shows very good milling qualities, M. 213/40 is, from that standpoint, definitely inferior to M. 134/32.

TABLE I

MILLING TESTS ON NEW SUGARCANE VARIETIES

<i>Variety</i>		<i>Sucrose % cane</i>	<i>Purity 1st expressed juice</i>	<i>Fibre % cane</i>
M. 213/40	...	13.59	84.8	10.9
M. 134/32	...	14.13	88.3	12.2
E. 1/37	...	14.77	91.9	11.1
M. 134/32	...	14.33	90.0	10.4

Factory Data

Final figures were received from twenty-seven factories that operated during the last crop. The highest production by one factory was 27,000 metric tons, the lowest 8,000 metric tons, and the average 17,000 metric tons. Other results are shown in Table II.

TABLE II

AVERAGE CROP RESULTS, 1950

<i>Sucrose % cane</i>	<i>Fibre % cane</i>	<i>Mill ex- traction</i>	<i>Sucrose in sugar % cane</i>	<i>Reduced boiling house recovery</i>	<i>Boiling house efficiency</i>	<i>No. of crushing hours per day</i>
14.14	11.8	94.6	12.09	88.5	99.0	19.9

Analysis of Alcohol.

Representative samples of alcohol exported by all distilleries were analysed. It appears from the results shown in Table III that the total secondary constituents vary from 6 parts per 100,000 to 138 parts per 100,000. In the case of distillery No. 4, it is obvious that the high value of the total secondary constituents is due to a faulty extraction of oils.

The routine control of the alcohol exported was continued—513 samples were analysed and graded prior to export.

TABLE III
ANALYSIS OF ALCOHOL

<i>Distillery</i> No.	<i>Acids</i>	<i>Esters</i>	<i>*Aide- hydes</i>	<i>†Higher alcohols</i>	<i>Furfu- ral</i>	<i>°G.L.</i>	<i>Total seconda consti- tuents</i>
1	0.15	6.5	2.1	6.0	Nil	95.7	14.7
2	0.11	—	2.3	33.0	„	95.4	—
3	Neutral	12.3	1.6	Traces	„	95.5	13.7
4	1.20	8.8	2.9	125.0	„	95.2	137.9
5	—	—	1.6	74.0	„	94.9	—
6	1.80	6.6	1.5	11.0	„	95.5	20.9
7	0.60	4.4	1.1	Traces	„	95.5	6.1
8	Neutral	9.7	2.9	Traces	„	95.4	12.6
9	—	—	1.2	18.0	„	95.5	—

Yeast Factory

The Yeast Factory continued to operate under the control of the Sugar Technology Division. During the year, 5,618,000 tablets were produced from distillery-residues.

Maize Mill

The Maize Mill was put under the control of the Sugar Technology Division. The main milling machinery is under a care and maintenance basis.

Production of food concentrates for animals is being developed.

Aloe Fibre Research

Fundamental research was done on the decortication of *Furcraea gigantea*. The results of this work will form the subject of a separate publication.

Staff

The Division has lost the services of Mr. R. Leclézio, the Assistant Sugar Technologist, who took employment at Union St. Aubin Factory.

Mr. S. Mariette joined the staff of the Division as Scientific Assistant.

S. STAUB,
Sugar Technologist.

* Jaulnes and Espezal Method.

† Komarowsky and Von Fallenberg Method.

Legislation

The following Ordinance and Proclamations were issued during the year :—

Ordinance No. 76—To amend the Animal Diseases (Consolidated) Ordinance 1925.

Proclamation No. 6—To amend Schedule to Proclamation No. 10 of the 19th March 1946 by the addition thereto of the sugarcane variety M. 423/41.

Proclamation No. 8—To prohibit the importation into Mauritius of the Sunflower Plant, "*Helianthus annuus*" from South America.

Proclamation No. 19—To amend Proclamation No. 1 of 1949 issued under Section 2 of the Importation of Plants (Diseases Prevention) Ordinance, 1910.

